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Telephone: WHItehall 9233 (12 lines) *Telegrams: "Trazette Parl, London"*

BRANCH OFFICES

GLASGOW: 87, Union Street . . . . . *Central 4646*
NEWCASTLE-ON-TYNE: 21, Mosley Street . . *Newcastle-on-Tyne 22239*
MANCHESTER: Century House, St. Peter's Square . . . *Central 3101*
BIRMINGHAM: 90, Hagley Road, Edgbaston . . . . *Edgbaston 2466*
LEEDS: 70, Albion Street . . . . . *Leeds 27174*
BRISTOL: 8, Upper Berkeley Place, Clifton . . . . *Bristol 21930*

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Editor: B. W. C. Cooke, Assoc. Inst. T.

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CONTENTS

	PAGE
Editorial Notes	421
Human Element in Modern Administration	423
Agreement on the Railway Wages Structure	423
Safety in Transport	424
Catering on British Railways	425
Amenities for the Indian Passenger	425
Letters to the Editor	426
The Scrap Heap	427
Overseas Railway Affairs	428
Signalling in Alsace-Lorraine	430
The Level Crossing Problem in Europe	431
Rubber Suspension in B.R. Rolling Stock	434
Reconstruction of Malayan East Coast Line	435
Train-Controlled, Recorded Station Announcing System	437
Personal	439

Transport and the Conservative Conference

AS was to be expected from the party in power, the annual conference of the National Union of Conservative & Unionist Associations at Blackpool produced no surprises last week when it debated transport and road safety. Most of the Conservative Party ideas on transport questions have been embodied in the Transport Act, 1953, and the proposals as to transport made at the conference could hardly engender any threat of further doctrinaire interference with the transport system of this country; there has been enough already of such interference by both political parties in recent years. The motion debated called for "the immediate preparation of a comprehensive and realistic scheme to bring the railways up to date, and to provide a road system designed to accommodate the growing problem of motor traffic. . . ." The mover, Mrs. M. E. Kellett, pointed out that since the war railway development in Britain had lagged behind that in countries such as France, Holland, and Italy, particularly in electrification. Railways, she said, could not hope to compete in the labour market. This motion lends weight to the much-discussed plan to spend some £500,000,000 on the re-equipment of British Railways, which may now be said to have considerable support in principle. Mr. John Boyd-Carpenter, Minister of Transport & Civil Aviation, recalled in his reply that both railways and roads had suffered from six years of war and their aftermath, and the accumulated deficiencies had to be faced. The British Transport Commission is preparing long-term plans. These may include the major changes in the structure and organisation of the Commission foreshadowed by Mr. Alan Lennox-Boyd, Mr. Boyd-Carpenter's predecessor, when giving his reasons for re-appointing Members of the London Transport Executive for one year only. In the meantime the Commission is developing diesel power, and Mr. Boyd-Carpenter said that some 800 diesel shunting locomotives should be in use in three years time. Experiments with gas turbine locomotives are also going ahead. The motion, with its provisions for railway modernisation, was carried by the conference and becomes the official view of that body. No doubt Conservative M.P.s will be pressed by their local Associations to put this policy into practice at Westminster in the near future.

Railway Accidents in 1953

THE report for the year 1953 of the Chief Inspecting Officer of Railways, Ministry of Transport, Lt.-Colonel G. R. S. Wilson, shows that the number of train accidents declined from 1,243 in 1952 to 1,123. The average for 1946-50 was 1,250. There was also a considerable decrease in the number of casualties caused by train accidents, which was 656, including 48 fatalities. This compared with 1,435 for 1952, including 133 fatalities, a number considerably swollen by the Harrow disaster in which 112 persons lost their lives. The 48 deaths last year included 22 passengers, seven railway servants and 19 persons who were occupants of road vehicles at level crossings. The 22 passenger deaths occurred in three collisions, at Stratford, Irk Valley Junction, and Bradford, Forster Square. Of these collisions, the first was responsible for 12 deaths, and the others for nine and one respectively. Of the 19 persons killed at level crossings, six were occupants of a light van involved in a level crossing accident in daylight at Ystrad Caron. The total of 306 fatalities in all movement by rail was equal to 0·7 per million train-miles. The total injured, 7,465, is the lowest since the 1940-45 period when, however, serious injuries only were recorded.

More Lightweight Diesel Trains

WITH the contract just placed with British United Traction Limited for 43 sets of power equipment and 21 sets of trailer car equipment for new multiple-unit lightweight diesel trains, British Railways have undertaken the expenditure of more than £3,000,000 on the lightweight diesel train development programme launched in 1952, and expanded considerably last February, when £2,000,000 was announced as the envisaged cost. The areas chosen for the diesel services vary greatly in geography and traffic. They range from the West Riding, where the first trains, with Leyland engines and Walker transmissions are now working, and West Cumberland and Lincolnshire, where it is planned to inaugurate services this winter, to East Anglia, Newcastle-Middlesbrough, and Edinburgh-Glasgow—this last with refreshment facilities—three districts which will complete the present programme. A service between Birmingham and South Wales also is envisaged. The two-car units may be combined in multiple to form four-, six-, or eight-coach trains, able to cope with wide fluctuations in traffic. An interesting addition to the services previously specified is that between Watford Junction and St. Albans, on which also diesel trains are to be introduced this winter, thus giving them the opportunity of proving their worth on a London outer-suburban route.

Fares Proposals for Northern Ireland

PROPOSALS made at the inquiry which concluded last week into the application of the Ulster Transport Authority for a new passenger fares structure make it of more than local interest. The Authority is concerned, among other things, to equalise its third class rail and its road fares, withdraw the second class, charge a first class fare 50 per cent above third class, and increase season

XUM

ticket charges. There is an unusually large amount of season ticket travel in the six counties, doubtless a consequence of the heavy residential traffic between Belfast and its "dormitory" towns, in an area which contains the preponderance of the population. The U.T.A. is alone among undertakings in Britain in retaining the second class on ordinary services, and is obviously justified on the grounds of conformity and economy in seeking to abolish it. The already close integration between the U.T.A. rail and bus services is carried a stage further by the proposal to equate their fares, to the extent that a station not more than half-a-mile from a bus route shall rank for charging purposes with the nearest bus stop. The initial hearings were reported in our October 8 issue, and a report of the subsequent proceedings is on another page this week.

Overseas Railway Traffics

CANADIAN Pacific gross earnings for August were $35,859,156, compared with $40,684,315 for August 1953, a decrease of $4,825,159. Working expenses fell from $38,704,308 in August last year to $33,917,328. Net earnings were $1,941,828, a decrease of $38,179 on the corresponding month last year. The aggregate gross earnings for the eight months from January 1 were $278,385,490, a decrease of $35,522,949 on the first eight months of last year. The decrease in aggregate net earnings was $2,585,295. Paraguay Central Railway receipts were G1,470,134 for the week ended August 13, falling to G1,390,134 in the following week and G1,303,106 for the week ended August 27. The week ended September 3 showed a sharp increase to G1,569,681, with G1,432,196, G1,473,987, G1,394,529, and G1,305,037 for the weeks following, the last figure being for the week ended October 1. The aggregate figure from July 1 to that date was G18,349,575, an increase of G5,205,479 over the corresponding period of the previous year. Costa Rica Railway traffics for July were colones 1,510,476, and for August were colones 1,314,067, compared with colones 1,391,475 for August last year. Aggregate receipts from July 1 were colones 2,824,523, a decrease of colones 218,425 on last year.

International I.C.E. Congress at The Hague

THE provisional details issued of the International Internal Combustion Engine Congress to be held in The Hague next May promise a full programme extending over four days, with six technical sessions and an opportunity for delegates to take part in interesting excursions after the conference itself has concluded, including a visit to inspect some of the diesel traction equipment of the Netherlands Railways and another to the works of Werkspoor N.V. at Amsterdam. As we commented editorially in our September 24 issue, many firms and associations in this country are lending their support, thus ensuring that British participation in the Congress will be on a substantial scale. The names of the chairman, secretary, and treasurer of the British National Committee, which is composed of representatives from the six trade associations interested and will send delegates to The Hague, have been announced and are given, with other particulars of the Congress, on another page.

The French National Railways in 1953

THERE has recently become available in Paris the annual report of the S.N.C.F. for 1953; it is probably the first time in history that the annual report of the French Railways has been issued before its counterpart on this side of the Channel. The report, a voluminous document, takes the form of a report by the Board to its shareholders—in major part the State—as presented at the yearly meeting of shareholders held in Paris last June. Special features referred to include the disastrous strikes which halted most of the rail movements in France in August, 1953, and negatived, to a considerable degree, the economies to be expected from improved efficiency and technical progress. Combined with a regression in economic activity, evidenced by a fall of about 9 per cent in passenger and freight traffic, the financial deficit for the year increased to 47,400,000,000 francs, a rise of some 15,000,000,000 francs over 1952. Shortage of capital precluded progress with reconstruction but electrification was continued in the Ambérieu-Culoz area, as well as on the stretch from Valenciennes to Thionville and in Savoy. We hope to refer to the report in greater detail in a future issue.

Five Years of London-Shenfield Electric Working

THE inauguration of the Manchester-Sheffield-Wath electrification may have obscured the fact that it is now five years since the other electrification initiated by the London & North Eastern Railway was opened to service—that of the Liverpool Street-Shenfield lines. The work on this scheme was abandoned on the outbreak of war but was recommenced in 1946 and pushed ahead with such vigour that on September 26, 1949, Mr. Alfred Barnes, then Minister of Transport, was able to drive the first electric train out of Liverpool Street Station. It may not be generally known that strenuous efforts were required by the engineers and staff to enable the inaugural train to leave to time. Only at midnight on September 24, 1949, was it possible to run the first test train into Liverpool Street Station, which gave only some 36 hours in which to make all final adjustments. The Manchester-Sheffield-Wath electrification has been more fortunate in this as it has been possible to introduce electric working in stages, whereas from the nature of the services out of Liverpool Street the whole scheme had to be changed over at once. On the successful completion of the Shenfield electrification almost the entire team responsible for the work was transferred to the Manchester-Sheffield-Wath scheme. It formed the basis on which the staff for that scheme was built up, and the results of its efforts have once more been shown by the successful introduction of a new electrification.

Western Region Record Run

A NEW record for the run from Plymouth Docks to Paddington was set up on October 7 when a "Castle" class locomotive of the Western Region hauled a boat train of five coaches, weighing 171 tons, over the 226½ miles in 3 hr. 37 min., gaining three minutes on schedule. The locomotive was, appropriately, *Isambard Kingdom Brunel*, one of the 1938 batch of this class. This beats by one minute the previous record for the journey, established on June 13, 1935, when the load totalled 250 tons, by another "Castle" class engine. The run last week, averaging 62·7 m.p.h. throughout, seemed to have been marked by consistently good work throughout; the maximum recorded speed was a little over 79 m.p.h. The tradition of fast running with the Plymouth boat trains is fifty years old, for on May 9, 1904, took place the famous run of the G.W.R. "Ocean Mail" from Plymouth to Paddington in 227 min. for the 246 miles of the old route via Bristol. It was on this run that *City of Truro* was said to have achieved a speed of 102·3 m.p.h. down Wellington Bank, a claim challenged in recent years.

An Example of Resource and Engineering Skill

GREAT courage must have been required by the Malayan Railway engineers in facing the task of reconstructing many big bridges on 200 miles of the East Coast line with the aid of only one 3-ton hand derrick and a battery of manual jacks, half of them damaged Japanese implements with locally hand-cut gears. As an article in this issue describes, this is what was successfully undertaken, with little or no steel apart from that salvaged. In some cases, various 250-ft. through spans weighing 400 tons, with one end damaged and submerged in a river, were lifted with the jacks mounted on a 75-ft. cantilevered extension over a pier from the adjacent span, a remarkably ingenious idea to meet the situation. Previously untrained staff carried out this and other works and local divers were responsible for fixing the lifting girders and tackle to the spans buried 25 ft. in sand under water.

Elsewhere pontoons were used in a strong current with rapidly varying water levels to lift partly-submerged 250-ft. and 120-ft. spans lying on their sides, and to right them for repairs and subsequent lifting on to the piers. Some of these lifts were up to 60 ft. Such improvisation and remarkable achievements do great credit to the staff, often working with the threat of attack by terrorists, and with the minimum of plant and only what steelwork they could salvage available.

Level Crossings

THERE can be no doubt that the only complete solution to the level crossing problem is the construction of over- or under-line bridges. Although some progress towards this end has taken place in Europe, the capital cost of the complete elimination of even those crossings over public roads is prohibitive; and despite its comparative efficiency, the British system of gates closing over both rail and road has not, for similar reasons, been universally adopted. Some less ambitious solution has, therefore, had to be sought. Under the impulse of rapidly expanding road traffic, considerable progress has been made in the development of various types of train-actuated flashing lights. Some Continental railways are experimenting with automatically worked lifting barriers. The growth in international road transport has made desirable some uniformity of protective devices, and both the International Union of Railways (U.I.C.) and the Economic Commission for Europe have been active in this respect. An article elsewhere in this issue gives details of the latest proposals and also describes typical signs in certain European countries.

The Human Element in Modern Administration

THE problem of the loyalty of the labour force towards the employing firm is one of the main questions discussed last week by Sir John Elliot, Chairman of London Transport, in a paper on the human element in administration read to the British Railways, Southern Region, Lecture & Debating Society. Sir John Elliot, as a former Chief Regional Officer of the Southern Region with many previous years' service as an officer of the former Southern Railway, was on familiar ground, and his views on the administration of a great modern undertaking, and more particularly one concerned with transport, have the authority of one who has been at the head of two Regions of British Railways—of the London Midland after the Southern—Chairman of the Railway Executive, and President of the Institute of Transport, besides presiding over the complex of London Transport with its countless administrative problems. The loyalties which often existed in the past between the labour force and the firm, he states, today are fewer, and sometimes no longer exist. In the discussion after his paper, he qualified this to some extent as regards British Railways by expressing his belief that after an upheaval such as the nationalisation of the railways in 1947, time must be allowed for the new organisation and for those who serve it to adjust themselves, their ideas, and their loyalties. As an example of the continuity of loyalty and of *esprit de corps,* he cited London Transport—which has had 21 years in which adjustments could be made, against British Railways' seven years since their formation—where the names of the component undertakings, such as the Metropolitan Railway, are perpetuated in sports and similar organisations; such names help to foster loyalty and pride in the undertaking.

Where good work is done continuously with quick promotion for those fitted for it, says Sir John Elliot, there also is enlightened management. The part played by the trades unions in promoting good industrial relations, he points out, is vital. The responsibility of the unions to train their people for leadership is heavy, for good union leadership is as essential as wise management; but he raises the question whether the large union is too impersonal, and whether the unions are concerned too much with politics and too little with industry.

With administrative and advisory staffs, selection and training of—and in unsatisfactory cases, discontinuance with—the potential leaders must be done whilst they are young. Training of the mind is important, and such training must be in the best sense liberal and humanistic, in support of which he quotes one of his predecessors at the head of London Transport, Lord Ashfield. Supervision of intelligent young people must be by people who are themselves intelligent and sympathetic. As to the reasons which prompt young people to enter a business, he does not perhaps give railway work its due as a vocation, though he mentions transport as an occupation which appeals to some. Railway operating, for instance, surely exercises an enormous attraction to young men—which may often be nullified by the contrary force of poor salary and prospects.

On individual versus team management, Sir John Elliot states the arguments for both with fairness, though he thinks that on the railways in this country some people, brought up under individual management, do not appreciate the benefits of team management where it is being adopted. In contrasting the position in Britain and the U.S.A., where it is the exception for the man at the top to be a technician, with that in some Continental countries, he underestimates, perhaps, the importance attached by some European railway administrations, notably the French National, to technical qualifications as some indication of mental discipline and education as much as evidence of technical training for the job. Whilst holding that the specialist "is apt to be tiresomely fond of his own 'crack pottery,' and there is none to say him nay," he specifically named Monsieur Louis Armand, Director General of the S.N.C.F., as a technician who is also a genius as a manager.

In his recipe for the perfect character for management he includes a dash of the condiment labelled by the late Frank Pick, who had not a little of it in his own character: "A spice of vice, a spark of irrationality, a fondness for inconsistency, a flash of genius." Few, if any, leaders possessed all the desirable qualities, but Sir John Elliot names two who had them in a great degree: Sir Herbert Walker—under whom he served on the Southern Railway—and Lord Ashfield.

For the successful conduct of a great undertaking, Sir John Elliot concludes, there must come, from the top, money, ideas, energy, and honesty of purpose. From the middle must come ambition, emulation, grinding hard work and honest endeavour. From labour must come self-discipline, self-respect and honest hard work. The rewards will be deep satisfaction, fulfilment of purpose, and an uplift of the spirit.

Agreement on the Railway Wages Structure

THERE are two encouraging features of the agreement reached last week between the British Transport Commission and the three railway trades unions, the National Union of Railwaymen, the Transport Salaried Staffs' Association, and the Associated Society of Locomotive Engineers & Firemen, on the revision of the railway salaries and wages structure, some details of which are given on another page.

It is encouraging that, after the apparent stalemates during the protracted discussions over the past few months, an agreement should have been reached at all, though in the case of the T.S.S.A., it is admitted to be an interim measure only, and the footplate grades are excluded from the agreement because the claims on their behalf being made by the A.S.L.E.F. are being referred to the Railway Staff National Tribunal—at the insistence of that union. Secondly, it is evident that the two unions concerned, in agreeing to relatively small increases, ranging from 6d. to 8s. 6d. a week for operating grades, and from £1 to £17 a year for clerical staff—over and above the increases granted last winter, in all cases—have realised the hard fact that the money to pay higher wages simply is not forthcoming, and the corollary of this, that the best, if not the only, way to obtain yet further increases in pay is to make the money available by increasing railway efficiency,

XUM

which will reduce operating expenses and obtain further remunerative business. It is satisfactory also that some recognition, albeit small, is made of the responsibilities of stationmasters and others holding supervisory appointments, who are to receive £10 more than those in the corresponding clerical grade.

The declaration that the Commission and the three railway unions, with some reservation on the part of the A.S.L.E.F., reiterate their determination to ensure that everything shall be done to implement the provisions of the agreement concluded last December, to improve the efficiency of the railway industry, cannot be greeted with enthusiasm.

A declaration of a similar nature was made on the occasion of the wages agreement of February, 1951. Both then and last winter, machinery was set up to examine, jointly by representatives of management and unions, ways of increasing efficiency. Much useful work has been done in this direction in recent months, but asseverations of the kind made last week tend to lose their force through reiteration. It might perhaps have been better to have assumed co-operation by all concerned in existing efforts to obtain efficiency, with, if possible, some pointer to concrete results achieved or to be announced in the near future.

Much of the success achieved in arriving at an agreement is due to the patience and skill in negotiation of Sir Brian Robertson, Chairman of the British Transport Commission, who has long and successful experience as a negotiator in other fields. That the man at the head of nationalised transport in this country should himself take part in the negotiations with the unions is not without its disadvantages. Sir Brian Robertson stands at the highest possible level to which questions can be referred or appeal made—short of resorting to an independent arbitrator. After reference to him, therefore, there is no line of retreat.

Decentralisation and delegation of duties in all spheres, moreover, are practices worth following in wage negotiations as in the other spheres in which Sir Brian Robertson has promoted them in the administration of the undertakings over which he presides. It might have been as well to have left the negotiations, except in the very last resort, at a lower level. These, however, are comparatively small drawbacks when they are considered against the fact that a further step has been made in achieving agreement and averting disastrous and embittering industrial troubles on the railways.

Safety in Transport

EMPHASIS on the reduction of the reliance placed on the human factor in transport by replacing or assisting that factor by mechanical devices was laid by Sir Gilmour Jenkins, Permanent Secretary, Ministry of Transport & Civil Aviation, in his Presidential address to the Institute of Transport last Monday. This mechanical assistance, he considers, is perhaps simplest to achieve on the railways where the vehicles, track, and equipment are under one ownership and management.

Mechanical and electrical devices prevent dangerous mistakes by signalmen, and the failure of drivers in their fundamental duty of observing and obeying the signals can be prevented by automatic train control. Man can rely far more confidently on the material products of his hand and brain than on himself. Much depends on the extent to which it is possible in each form of transport to reduce reliance on the human element and to increase reliance on the material, though no equipment is better than its maintenance. The human factor can never be escaped entirely in the long run.

The logical order in which to consider the various forms of transport is the order of the number of dimensions in which the vehicle moves. On this basis come, first, railways, in one dimension—the train cannot be steered by its driver. Second, road traffic, in two dimensions though limited to a paved track, third shipping, in two dimensions, and last aviation in three dimensions. That is not, however, the order of difficulty in eliminating accidents, as the human element plays such a predominant part in causing accidents on the road. The best order for his purpose, he said, was rail, sea, air, road.

Railways, Sir Gilmour Jenkins considers, are the simplest case, although the means used to ensure safety are elaborate, highly ingenious, and costly. The dividend from these measures is the ability to run heavy trains with large numbers of passengers or large amounts of freight at high average speed and in great safety, and to make the maximum use of a track which has to take trains of greatly varying speeds. The first requirement is a reliable track and reliable rolling stock. The second requirement is that no train shall be permitted to get into such a position on the track that it can collide with an obstruction—particularly another train. This involves the use of the various devices described by Lt.-Colonel Wilson in his Cantor Lecture to the Royal Society of Arts—the subject of an editorial article in our March 12 issue—the use of signals and the block system to ensure that not more than one train is on a particular section of the line at any particular moment, the interlocking of signals and points and track circuiting to indicate the position of a train on the line. These are devices intended to eliminate signalling errors, and to ensure that, if the driver obeys his signals, his train will be safe.

To assist the driver, colour light signals, more easily seen than semaphores in mist or fog, are being used increasingly. Technical aids to drivers in the observance of signals are more difficult to provide, as the equipment on the ground must link the wayside signal aspects with a moving engine, and moreover must work reliably under exposure to all weathers. A.T.C. is to be extended gradually to all the more important routes of the country when present intensive tests with improved apparatus are completed. The title A.T.C. may appear to be rather misleading as perhaps giving the impression that the equipment can do much more than it sets out to do, which is only to guard against one particular class of failure.

In this country the State has always exercised a comparatively light hand in its control of safety in railway construction and operation through the medium of the Railway Inspectorate, first established under the Board of Trade in 1840, and Sir Gilmour Jenkins thinks this is largely because the intrinsic safety of railway travel was established in quite early days, and suggestions for closer power of control have never found favour with the Governments of the day. The Government has to approve new passenger railways or alterations to them after examination of the plans by the Railway Inspectorate and subsequent inspection. Once new works have been approved the Government has no jurisdiction over their maintenance, for which the responsibility rests with the railways. Except on electric tube lines it has no jurisdiction over rolling stock construction.

The various Acts require the reporting of accidents of certain defined classes and provide for the holding of Inquiries. Although there is power to order a formal investigation with full court procedure, this has not been done since the Tay Bridge disaster in 1879, and since then all railway accident Inquiries have been conducted by the Inspecting Officers with the sole object of ascertaining the cause of the accident and making recommendations to prevent recurrence. The Inquiry Reports have to be published under statute, and although their recommendations cannot be enforced by law, thorough investigation and discussion with railway officers, he states, has usually resulted in their acceptance.

Sir Gilmour Jenkins then considered the safety problems of other forms of transport, concluding that on rail and at sea the major problems of safety are solved, and an astonishingly high standard of safety has been achieved in the air. By contrast with these, the final responsibility for safety on the roads lies on the individual road user, and on him depends, ultimately, the hope of a permanent and substantial diminution in the toll of death and injury in that sphere.

Catering on British Railways

THE most recent catering development in British Railways' passenger trains is the cafeteria-restaurant car, introduced during the past summer and described in our issue of July 16. Indications are that the innovation has been welcomed by the public. An article in a recent issue of *British Railways Magazine* states that British Transport Commission Hotels & Catering Services reported a rise in takings of some 38 per cent in a week or two after the introduction of the new car; this might be a flash in the pan, but it is a most encouraging sign. One advantage of the new cars is that they allow a far greater number of passengers to obtain meals than has ever been possible with restaurant or buffet cars of the conventional type. There is also no doubt that many passengers who would not think of paying 7s. 6d. for a full-course meal have availed themselves freely of the new facilities, which, therefore, are the source of entirely new revenue.

At the same time a proportion of the travellers, particularly those travelling in business in mid-week, do require full-course meals, for which the new cars provide. There are certain difficulties in providing both full-course meals and cafeteria service from the limited resources of a cafeteria-restaurant car, but there is no reason why these should not be overcome, as no doubt they are being. It is probable that restaurant cars serving full-course meals exclusively will continue to run in many long-distance trains. It is important that this facility, which is an essential amenity of railway travel more necessary than ever with the growth of helicopter and other air transport and of private motoring and motorcoach travel, should not be dispensed with simply because it may not pay in certain trains. This fact was realised by the railways before nationalisation, but at least until recently, there seemed to be a tendency, under nationalisation, towards withdrawal of important ancillary facilities, as in the closing of railway hotels, which helped to create traffic—or stop losing it—when individual catering and hotel commitments showed a loss.

There are at present nearly 650 (including many Pullman) restaurant and cafeteria car services in operation on Mondays to Fridays (and supplemented at weekends) in Great Britain. Extension of refreshment-car facilities seems likely, on the one hand, to take the form of cafeteria-restaurant cars or of simple cafeteria cars; there are on the other hand many possibilities in the extension of Pullman car services which the British Transport Commission intends as a result of its recent purchase of the shares of the Pullman Car Co. Ltd. Flexibility in the provision of refreshment-car services in the several Regions is afforded by the discretion given to Chief Regional Managers and by the appointment to their headquarters of liaison officers of the Hotels & Catering Services.

Much has been done since the war to improve the existing refreshment room facilities in stations. Most of the refreshment rooms of railways in this country were built in the latter half of last century, to cater for the habits and tastes of travellers very different to those of the present day. Plans have been made to adapt these facilities to modern tastes and good progress has been made in modernising them. Over 50 refreshment rooms have been converted, and plans for dealing with 30 more are in hand. A survey of refreshment room facilities shows that these are no longer wanted at some places, and closing unwanted rooms has made it possible to concentrate on modernisation where demand is greatest. Many station refreshment rooms have been converted to cafeteria service, which is stated to be two-and-a-half times faster.

Another development is the sale of food and drink at stations by automatic machines; these afford economies in staff while giving a 24-hr. service. Many more refreshment tea trolleys of improved design are available, also trolleys for sale of ice cream, packed meals, and so on. Mobile refreshment kiosks provide refreshments where there are no facilities, and also serve to test the need for permanent provision, or to augment the existing service. Small self-contained units can be towed by motorcar from one station to another. Mobile canteens are also regularly used at stations during events such as race meetings.

Increasing use is being made of packed meals; a ready prepared picnic lunch, at prices from 2s. 6d., has proved very popular with organised parties and individual travellers. For parties cartons are packed in bulk and thermal urns of tea provided. Another innovation since the war, is the compartment conversion unit; equipment can be installed in 8 min. in a compartment to transform it into a pantry from which two attendants can serve refreshments throughout the train.

Whilst much is being done to improve catering at stations and in trains, there is, as there is bound to be, much criticism of facilities. Many of the shortcomings are the result of the inadequate facilities—inadequate largely through growth of traffic—inherited from a former age, combined with restrictions on capital expenditure on improvements. Shortage of labour is a difficulty, especially in refreshment rooms in areas where more attractive occupations compete. It is, moreover, not always realised by some members of the public that in present conditions in the labour market, and under the Catering Wages Act, service of meals and refreshments by waiters and waitresses is bound to be relatively expensive. As with catering establishments outside the railways, the public could help by complaining, when there is occasion to do so, to those responsible.

The standard in refreshment cars is bound to vary with the many relevant factors, including the pressure of business, but the 7s. 6d. full-course meal in a British Railways restaurant car often excels anything to be had at that price in an hotel or restaurant. The Pullman Car Company has its own high standards. By and large, the railway traveller in Britain obtains refreshments of all kinds at prices which are considerably lower than on many railways on the Continent, and reasonable compared with catering outside railway premises.

Amenities for the Indian Passenger

FOR many years a great deal was done by the State and privately-owned railways in India for the comfort and wellbeing of the passenger; and not only for the minute percentage of first class, the somewhat larger percentage of second and—on railways where this class existed—" intermediate " class, but also for the vast majority of third class passengers. All manner of amenities were provided, as they are today, for upper class passengers. The Indian railways were some of the first in the world to provide electric light and fans in passenger vehicles, and to include restaurant cars in many mail and even some secondary main-line trains; many of the restaurant car services did not, and could never be expected to, pay in themselves, but were rightly regarded as an essential amenity of passenger travel.

Third class fares in India have long been some of the lowest in the world. At one time, it is believed, travel by ordinary (i.e., not mail or express) train was at the rate of five or six miles for one penny. Even today the third class mail or express fare works out at about one-half-penny a mile. The wants of most third class passengers were few, and remain relatively few even today. The measures taken for their wellbeing and comfort consisted largely in the provision of ample and hygienic water supplies at stations of facilities for sale of food in hygienic conditions. Because many travellers are prepared to arrive early at the station and wait many hours for the train, waiting accommodation adequate for the vast numbers making use of the principal stations, including those changing at junctions, and suited to the varying climatic conditions encountered in different parts of the country, has always been of importance, and provided on an extensive scale. Refreshment cars providing meals for the adherents of the different religions and members of castes, have been running in a number of services for many years.

Since the last war there has been a drive to add to amenities, more particularly for third class travellers. The reasons for this are various. They include, in the case of upper class passengers, the necessity to compete with air travel over the longer distances, which no doubt has resulted in the increase over the prewar figure in the

XUM

number of air-conditioned coaches. There are also a desire to improve the lot of the poorer traveller on humanitarian grounds, the fact of bus competition with some train services, and the undoubted fact that with increasing industrialisation, and a rise, at least in some regions, in the standard of living, the third class traveller expects more.

The drive is resulting in many measures of which particulars have been given in this journal from time to time. Among the chief are the provision of electric fans and additional electric lights in third class coaches, improved waiting and refreshment room accommodation, greater cleanliness of trains and stations, improved punctuality, and an increase in the number of refreshment cars serving inexpensive Indian meals. Some former intermediate class compartments have been made over to third class travellers, and, similarly, second class accommodation to intermediate.

One of the greatest steps to improve third class travel has been the increase in the number of fast trains including third class accommodation. This has been in process for many years. Only one train in the Republic of India, the electrically-hauled "Deccan Queen" between Bombay and Poona (first and second class only), does not—or very recently did not—convey third class travellers. All the mail and other fast trains, including the world-famous "Frontier Mail," include third class. Besides this, a number of third class only expresses, known as *janata* ("people's"), run on fast schedules over many lines. In some cases they provide the fastest service available.

An indication of the importance attached to amenities for passengers is the appointment, approved by the Railway Board, of six special officers designated as Deputy General Managers (Amenities) who will each work directly under the respective General Managers of the six railways. They will co-ordinate all work relating to passenger amenities and have been assigned a wide range of functions to ensure a minimum standard of amenities to the travelling public. They will also provide the necessary co-ordination between the various departments of each railway dealing with passenger amenities. They are also to ensure courteous behaviour on the part of the staff towards the public and greater attention to their complaints, and try to eradicate corrupt practices in matters such as reservation of berths. The work of the departments concerned with complaints is to be tightened up, particularly in regard to the maintenance of complaint books at stations.

LETTERS TO THE EDITOR

(*The Editor is not responsible for opinions of correspondents*)

Suburban Train Services in the London Area

September 28

SIR,—The improvement represented by the regular interval services in the Birmingham area of the Western Region is a notable achievement. Scope for similar improvement is offered by the steam services between Euston and stations beyond Watford, and by suburban services from and to Paddington and St. Pancras, and—surprisingly—by the Baker Street-Aylesbury service.

The Paddington-Slough-Reading service seems to offer the best prospects of attracting traffic in view of the rapid growth of Slough. The interval in off-peak services could be 30 min., as in the Southern Region. The evening peak service from Paddington also could be improved; at present there are trains at reasonably frequent intervals, but with some long gaps, apparently necessitated not so much by paths for main-line trains as by provision for duplicating these as required.

Similar considerations apply to the St. Pancras and Euston services, in the light of the increases in population, especially of Luton and Hemel Hempstead.

Yours faithfully,

R. G. R. CALVERT

45, Woodwaye, Oxhey, Watford

A Subsidy for the Railways

October 4

SIR,—The article under this title in your issue of September 17 contained this most significant sentence: "It must be remembered that all railwaymen, and not only the lower-paid wages grades, are poorly paid in relation to men with corresponding responsibilities in other walks of life."

If there is any employee of the British Transport Commission to whom this refers with a special emphasis, it is the professional engineer. Despite many efforts over the years by professional engineers employed by the B.T.C. to obtain salary scales more in accord with those offered by other employers, little has been done to rectify the position. It was for this reason that our members in the employment of the Commission recently requested the Engineers' Guild to take this matter up on their behalf.

It is thought that when the facts are put to the Commission in due course, there will be little difficulty in demonstrating, firstly, that professional engineers employed by the B.T.C. are inadequately remunerated, and, secondly, that this condition has an increasingly adverse effect upon the recruitment and retention of properly qualified engineering staff.

The British Railways proposal to spend £500,000,000 on modernising and re-equipment gives emphasis to the urgent need for more enlightened treatment of their professional engineers.

Yours faithfully,

J. H. W. TURNER,
Honorary Secretary

The Engineers' Guild Limited,
78, Buckingham Gate, S.W.1

Closing of Branch Lines

October 3

SIR,—I refer to Mr. R. E. G. Weddell's letter in your October 1 issue, on the suggested re-opening of the closed Isle of Wight lines.

In your issue of April 3, 1953, you were good enough to publish my views on the £1,000,000 being spent on railway ships in Scotland, and the strange contrast between Scotland and the South of England, in that as regards the threatened closing of part of the railway system in the Isle of Wight, no help was being given to keep the service intact, and again, in North Wales, the generosity given to Scotland was not in evidence, even on a small scale, in re-opening the Llanberis branch—the rail gateway to Snowdonia—though there is extensive publicity of this as a tourist area.

No reply was given by the British Transport Commission on these matters, and it seems very doubtful whether any notice at all will be taken of Mr. Weddell's proposals by those in authority.

The Commission has failed to grapple with the country's transport problem, and must go. Those who believe that an expansion in railway transport is beneficial to the life and economy of the country should elect representatives to Parliament to seek new leadership in transport, initiate private enterprise as occasion demands, and achieve more safety on the roads—there were 414 killed and over 23,000 injured last August, the highest monthly total so far this year—by cheaper and heavier traffic on the rails.

Yours faithfully,

ROBERT W. LEWIS

Beth-el, 104, Leggatts Way, Watford

THE SCRAP HEAP

New Lines

The 100-year-old former Midland Railway station at Ilkeston, Derbyshire, has reopened as a hardware shop. Since the last train stopped there in 1947, the station has been offered for sale by British Railways. It was considered suitable for use as an old people's club, a Civil Defence post, and a community centre, but local organisations could not raise enough money to buy it.—*From "The Manchester Guardian."*

The First Electric Age

A steam locomotive has more "personality" than an electric one; and an old steam locomotive has more than a modern one. We have had time to tune in to the wandering soul of steam. . . . Now the soul of *electric* railways is becoming faintly perceptible.

There are now some quite old electric railways. Creeping about through unknown London suburbs that have not changed since the days of "The Diary of a Nobody" are strange brown trains. Their carriages are exactly like the brown interiors of Victorian saloon bars; heavy brown wood, little snug seats, brass rails and engraved glass. Dimly these trains grope under Hampstead Heath, vaguely they stop at derelict wooden stations which are always on embankments high above strange shopping streets. . . .

Now, in a loose sort of way, Baker Street is the headquarters of these brown railways. Not all of them actually pass through Baker Street, but it is nevertheless the nearest thing Early Electricity has to a terminus. Consider the name given to the deeper line there —Bakerloo. This wedding of suburban bathos to the heroic implications of Waterloo is perfectly redolent of the synthetic quality of the First Electric Age. Baker Street is the nearest thing electricity has to steam's Euston. It was at Baker Street that I saw painted on a carriage the words: "Live in Metroland." Metroland is a country filled by the vibrations that countless commuters, daily travelling on apparently impersonal electric trains, have left behind; for all human life leaves vibrations. . . . They enter London under dusty concrete pillars supporting piles of flats; Metroland seeps into London through tunnels; and it gives meaning to electricity.—*Paul Jennings in "The Observer."*

Mind the Doors, Please

Septuagenarian though it has just become, the "Inner Circle" (completed in 1884) was not the first venture in underground travel. Urchins of the 60s were jeering at the "sewer rats," as the pioneer passengers were called, who surfaced from their smoky ordeals. London then led the way which was to be followed by, among other cities, Paris and Berlin, Madrid and Moscow, New York and Buenos Aires. It was a way which few much liked at the time and, even on this birthday, it may not, perhaps, be greeted by many with more than two cheers. . . . But the most gloomy foreboding heard at the start did prove unfounded and many of the hardships have disappeared. Clouds of smoke and steam went up the legs of trousers whose wearers had to draw such solace as they might from being provided, in the carriages, with carpets and mirrors and being offered, at the stations, a hot-water-bottle service. The hardy passengers were accused of patronising a threat to foundations. —*From "The Times."*

Natural Overline Bridge

Photo] [*F. H. Worsfold*

Mixed train on Tabora-Mwanza line, Tanganyika, East African Railways, passing under natural rock arch

Progress

(*Apropos recent bickering in the "Scrap Heap"*)

I love these young "moderns,"
they write with such charm;
And, if they're not ruffled,
they won't do much harm.
But, should one gainsay them,
they rush to engage
In battle and, heathen-like,
furiously rage.

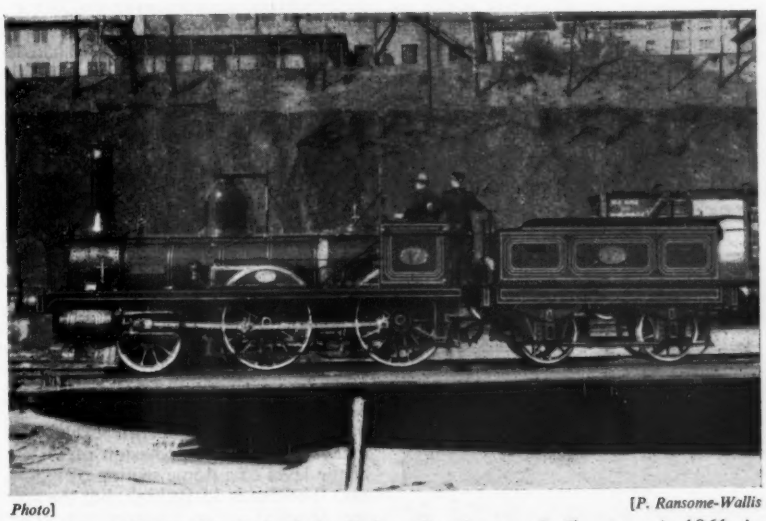
It's quite an old story,
age-old, but still true,
That, lured by the glamour
of much that is new,
Youth tends to ignore
that wise dictum of old—
That all things which glister
aren't bound to be gold.

No man in his senses
hates progress *per se*,
But will o' the wisps
aren't the same cup of tea.
Age greets so-called "progress"
with dubious delight
And the trouble with age is
it's so often right!

But, when "progress" proves to be
no planner's fad,
You'll find that the old 'uns
will all cheer like mad.

SCORPIO

British-Built Veteran Locomotive in Norway



Photo] [*P. Ransome-Wallis*

Locomotive "Caroline", built by Robert Stephenson & Company in 1861, *in steam at Oslo, Norwegian State Railways, in June,* 1954

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

INDIA

Derailment at Siwan

The enquiry into the accident at Siwan, Southern Railway, where in December, 1953, an express was derailed on facing points leading from the main line to a loop, has revealed that the points were set for the loop instead of the main line and the engine and one bogie had already passed on to the loop. An incoming train was standing at the outer signal and apprehending a head-on collision, the point jemadar reset the points, derailing three bogies and stopping the engine. The jemadar and pointsman concerned have been sentenced to one year's imprisonment.

New Metre-Gauge Coaches

The first of 200 metre-gauge coaches ordered under the rolling stock programme for 1952-53 are being delivered. One hundred are being manufactured by the Gloucester Railway Carriage & Wagon Co. Ltd. and the other 100 by La Brugeoise et Nicaise & Delcuve, S.A. The coaches weigh about 12 tons each and are 90 ft. long and 9 ft. wide. They have been delivered as shells, and the fittings and equipment are being added in the railway workshops in India. The present programme is to fit out 150 of the coaches at Golden Rock and 50 at Lallguda Shops (Hyderabad). They will be used on the metre-gauge lines in the South. After the delivery of the whole order of 200 coaches, another 200 third class metre-gauge coaches ordered from the same Belgian manufacturer under the 1953-54 programme are expected to be delivered.

The delivery of 250 coaches ordered in India under the 1953-54 programme should be completed shortly. They are for metre-gauge lines of the North Eastern, Northern, and Western Railways.

QUEENSLAND

The "Westlander" Train

The fifth air-conditioned train of the Queensland Railways went into service between Brisbane and Cunnamulla, 604 miles, on August 24, under the title of the "Westlander." The five trains are part of an order for eight being executed by Commonwealth Engineering (Qld.) Pty. Ltd.; the design was described in our June 5, 1953, issue. The first, known as the "Inlander," went into service between Townsville and Mount Isa in February, 1953, and the second and third, in June and November, 1953, providing the "Sunlander" service between Brisbane and Cairns. The fourth train, the "Midlander," runs between Rockhampton and Winton and was introduced last May. The remaining three trains will replace stock which is not air-conditioned on the Brisbane-Cairns service.

WESTERN AUSTRALIA

New Suburban Service

With most of the 18 new suburban diesel railcars now in service, the railways are drawing up plans for improved passenger services on the Perth suburban lines. It is planned to provide a 20-min. service between Fremantle, Perth and Bellevue, with trains leaving terminal points on the hour and every 20 minutes. On the South Western line to Armadale a 40-min. service will be provided, and additional trains will run on all lines during busy times.

To attract additional traffic from competing services new stopping places will be introduced, strategically situated between existing stations, and the better acceleration and speeds of the new units compared with the steam locomotives will permit faster overall timings, after allowing for the extra stops.

During the off-peak periods the services will be maintained with single railcars, strengthened by steam trains which will be restricted to a load of three saloon cars during morning and evening peaks

CANADA

C.N.R. Earnings

In August gross operating revenues of the C.N.R. fell $5,965,000 below the corresponding period of 1953. Because of the continuing programme of reducing expenses, operating charges were brought down by $3,526,000, with the result that the net operating revenue for the month was $2,439,000 behind the previous year.

The aggregate figures for the eight-month period lend emphasis to the statement by the C.N.R. a month ago that the company would have an overall deficit for the year. Operating revenues for the first eight months totalled $423,973,000, a decrease of $45,762,000 compared with 1953. Operating expenses for the same period amounted to $417,756,000, a reduction of $31,893,000. As a result, net operating revenues were $6,217,000 compared with $20,086,000 last year. These figures do not include taxes, equipment rentals and fixed charges.

UNITED STATES

"Hi-Level" Coaches

Two 85-ft. cars of an entirely new design have been delivered by the Budd Company to the Atchison, Topeka & Santa Fe Railway, for operation on the all-coach 39½-hr. streamline train "El Capitan" between Chicago and Los Angeles. As their name indicates, the passenger accommodation of these cars is entirely on an upper level, with the floor 8 ft. 7 in. above rail level, which makes possible the provision of 67 seats at the level of a dome section of a dome car. The car is 15 ft. high, but the seats are reached from a depressed centre aisle.

Entrance is through centre doors,

Electric Working in the Melbourne Suburban Area

Flyover at Burnley for down Eastmalvern line suburban trains, spanning the eastern suburban line to Camberwell, Box Hill, and Ringwood. The Victorian Railways main line is to be quadrupled from Flinders Street to Burnley

which lead into a low level vestibule Baggage is stacked in shelves along a corridor leading from this vestibule, and the passengers proceed by a curved stairway to the upper deck. Here the seats, upholstered in foam rubber, rotate and are adjustable for reclining. In the depressed centre portion of the lower level, rest rooms are provided. At the ends of the coach, between the high level floor and the bogies, service equipment is located, including the air conditioning equipment and auxiliary power generators and batteries.

Two of these cars are to be run coupled. Between them there will be communicating gangways at the upper level and at the outer ends of the twin there will be stairways down to gangway connections at the normal level.

NORWAY

Oslo Central Station Scheme

A scheme to abolish Oslo West Station and project the western lines in tunnel under the centre of the city to Oslo East Station, which was to be rebuilt as the central station, was reported in our August 18, 1950, issue. It has been approved in principle by the State Railways and is now being examined in detail.

The architects who submitted the selected design have published revised proposals which allow for the reconstruction of the station in five stages. In the first stage, the existing building would still remain intact, and part of the new building would be erected. In the second stage, one wing of the old building would be taken down, permitting the construction of sufficient platforms to enable the old platforms to be closed.

The process of removing parts of the old building to make room for further parts of the new one would continue during the third phase. In the fourth stage, the last remnants of the old station would disappear, and the valuable site above the tunnel entrance would be used for an office block with congress hall and exhibition hall. The station would then be complete except for the proposed new office block for the State Railways administration which would form the fifth and final stage of the work.

ITALY

New Trains on Rome-Alatri Line

The 62-mile 950-mm.-gauge line from Rome to Fiuggi and Alatri is now using three new triple-car articulated electric trains on its 1,500-volt d.c. system. This line has 1 in 16·6 grades worked by adhesion and to give good performance uphill, and in acceleration, every axle on the train is motored. The three coaches are carried on four bogies, and are driven by eight 80 kW. (one-hour) traction motors. Overall length of a train is 103 ft. but maximum width is limited to 7 ft. 9 in.

The accommodation includes 18 first class and 72 third class seats plus standing room, and also a small baggage and parcels space in one of the end cars. Top speed is 50 m.p.h. The electrical equipment and the bogies were made by the Tecnomasio Italiana Brown Boveri, and the bodies at the Stanga works. Against the empty weight of 57 tons there is 15 h.p. per ton provided, or 11¼ h.p. per ton of fully laden weight. Electromagnetic track brakes are fitted for use in the event of an emergency.

Publications Received

Those were the Trains. By H. Gordon Tidey. Hampton Court, Surrey: Ian Allen Limited, Craven House. 9 in. × 6 in. 64 pp. Illustrated. Price 7s. 6d. —Mr. Gordon Tidey has long been famous as a railway photographer. For well over 50 years, he has devoted a week annually to a tour for the express purpose of recording trains and locomotives with his camera, and nearly 120 of his photographs have been reproduced as half-tone illustrations in the present work. A wide variety of subjects from many parts of the country provides examples of the four mainline railways of the grouping period and several of their constituents. The book is an interesting pictorial record, not only for those who remember the years before the grouping, but for a younger generation whose experience does not extend beyond recent years.

Railroad Operation & Railway Signalling. Second Edition. By Edmund J. Phillips, Jr. 214 pages, 8 in. by 5⅛ in., with 64 figs. and some photographs. Published by Simmons-Boardman Publishing Corporation, New York. Price $2·50.—The first edition of this book appeared 12 years ago. In the form of 390 well selected questions and answers it deals with the general theory and practice of train operation and signalling in North America today, sufficiently to enable anyone to obtain a good idea of the entire range of the subject and put himself in a position to study it in greater detail in the articles appearing in the monthly journal issued by the same publishers or more elaborate works. A large number of circuit and other diagrams make the replies to the questions particularly easy to follow. In the framing of both much thought has been bestowed on the form of words so as to anticipate any difficulties the reader might be likely to have. Some items such as centralised traffic control and cab signalling and automatic train control are necessarily treated only in outline, but automatic signalling and power interlocking are extensively noticed, with the associated rules for train operation generally adopted in the North American continent. It is significant of the trend of signalling practice there during the present century that mechanical equipment is hardly referred to at all. The book is to be recommended to all students of signalling and should prove of much value to those desirous of familiarising themselves with the principles governing signalling today across the Atlantic.

The Spiral Tube & Components Co. Ltd. Jubilee Handbook.—To commemorate its golden jubilee, the Spiral Tube & Components Co. Ltd., Stanmore, Middlesex, has issued an illustrated handbook which traces the activities of the firm since its inception in 1904. Originally the firm's products included radiators for commercial vehicles and aeroplanes which included a finned tube; this was subsequently developed into a detachable header type radiator. Particular attention was subsequently paid to the application of the spiral tube to the cooling of electrical plant, transformer oil coolers, refrigerators and unit air heaters. The illustrations include the Queensland Railways 1,500-h.p. diesel-electric locomotive, the New Zealand Government Railways 660-b.h.p. locomotives, both of which were built by the English Electric Co. Ltd.; the Tasmanian Railways articulated railcars with Drewry Car Co. Ltd., 150-h.p. power bogies, and the Yorkshire Engine Co. Ltd. 400-h.p. diesel-electric locomotives with B.T.H. electrical equipment, and Davey Paxman diesel engine, all of which were fitted with Spiral Tube & Components Co. Ltd. equipment.

British Transport Film Library.—A new catalogue of films, film strips, and lantern slides available in the British Transport Commission Film Library has been issued and is obtainable from British Transport Films, 25, Savile Row, London, W.1, price 1s. The films and slides are available for free loan to educational authorities, clubs, societies, institutes, and industrial and commercial associations and companies. All films may be had in 16-mm. size and most in 35-mm. size. To select at random a few from the 150 or more titles —"Farmer Moving South," "Permanent Way Renewal," "Welsh Magic," "Royal Winchester," and "The Job We Do,"—will indicate the wide range of subjects covered.

Beclawat Rolling Stock Equipment.—An illustrated loose-leaf booklet has been issued by Beckett, Laycock & Watkinson Limited, Acton Lane, London, N.W.10, which provides much information relating to the design of railway rolling stock and road transport passenger vehicle equipment manufactured by the firm. Relevant details are given of the many types of fixed, sliding, and drop windows, with layztong or sash balance operation. Details are also included of sliding door gear, Metalouvres, and locks. Diagrams enable intending purchasers to specify requirements.

Signalling in Alsace-Lorraine

Complexities arising from varying practices under French and German administration

WHEN Alsace and Lorraine were ceded by France to Germany in 1871, 476 miles of railway, of which 195 were single line, were made over from the Eastern Railway of France to German control. The subsequent economic development of the two provinces led to much further construction, and in 1918, when the French authorities again took over the working, the total route mileage was 1,234, over 55 per cent of it with two or more tracks. Very little signalling was in existence in 1871, and the German management had been able to change the French double-line sections to right-hand running (German practice) with little difficulty. Good signalling equipment thereafter came to be provided; practice was based entirely on German principles, with all points trailable, an absence of shunt signals in the usual sense, and station working centralised under the control of a supervisor, completed by absolute block working throughout.

Resumption of French Control

In November, 1918, the French management found itself in possession of a railway system which had suffered negligible war damage but was equipped everywhere on principles and with plant very different from those met with elsewhere in France. The Alsace-Lorraine system was not re-absorbed by the Eastern Railway of France.

There was no way of causing working to conform with that of the Eastern, Northern, P.L.M., and other French railways, at that time separate railways, on which indeed practice was not everywhere quite the same in some important respects. The white light for "clear" had been abandoned already in Alsace-Lorraine, but to return to left-hand running was out of the question. All that was done was to put flyovers near the former Franco-German (1871-1918) frontier points to effect the change from left-hand to right-hand running, so eliminating the scissors crossings previously in use.

No French firm was experienced in manufacturing the types of signalling apparatus used in the territory recovered from Germany, and it became necessary to establish a factory locally to avoid dependence on German industry. A little was done to bring the working into less disagreement with the practice on adjoining French lines, but there was no chance of unifying the signal aspects. A reasonable degree of standardisation first had to be achieved in the rest of France, not itself accomplished for some time. After that, and not long before the last war, the difficulties became fewer, but not altogether avoidable short of adopting colour-light signals everywhere.

In 1945, of a total of 750 signalboxes 580 were found to be practically intact and 170 destroyed or badly damaged; a few of these last were repairable. Only exceptionally were all boxes at a station found useless.

It was necessary to reconstruct as quickly as possible to designs already well known, with the result that German type equipment must be expected to last for many years yet, certainly as regards mechanical installations.

Some power signalling of German make existed in 1914, and in 1918-39 other installations were made by French firms according to traditional Alsace-Lorraine operating methods, including route lever frames with, however, special arrangements for working points individually during shunting in a manner not met with ordinarily in French layouts. The equipment which was put in at Lutterbach, a junction on the Strasbourg-Basle main line, was illustrated in our issue of February 19, 1937. In this way the number of signalboxes, rather large under the older methods, was much reduced.

Strasbourg Central Station

Although Strasbourg Central Station, where the management of the Alsace-Lorraine railways was located, was an important traffic interchange point, the signalling was of very old design, mostly dating from the reconstruction of the 1870 layout by the German management, completed in 1883. In 1918 there were six mechanical boxes, one operating points only, and one supervisor's control room, forming the upper floor of one of the boxes, the connections thence to the subordinate boxes being effected entirely by double-wire transmissions. It is thought that this station was the last large one left anywhere with this cumbersome mechanism, long out of date.

By 1938, when the Alsace-Lorraine system was absorbed into the Eastern Region of the National Railways, enlargements, leaving the station with nine through and two bay platform faces, had necessitated four more signalboxes, also mechanical, but a change to power working had been decided on.

The choice fell on an improved form of the apparatus used at Lutterbach, with two boxes only, one at each end of the station, except for some mechanical working inside the goods yard. The route-lever frames were ready at the outbreak of war in 1939, when the work was stopped. The German occupation authorities insisted that it be taken up again, but only on July 7, 1946, was the south signalbox opened. An illustration of one of the frames appears in our issue of September 1, 1939.

The unusually large number of shunt movements led to the adoption of independent signals for them, combined with running signal indications conforming to Alsace-Lorraine practice, and a supervisor at a controlling desk in each signalbox. The German staff during the occupation of 1940-45 had made no material alteration in these arrangements.

Assimilation with French Methods

The opportunity was now taken, however, to make some alterations to bring the working more into harmony with standard S.N.C.F. methods, including adoption of the double red absolute stop indication and elimination of the supervisors. The north signalbox was opened in accordance with this plan on November 15, 1953, and corresponding modifications are in progress at the south box. Trailable points are being retained, however. This work, which involves a total of 170 four-position route-levers, over 120 pairs of points and some 175 signals of all kinds, is described by Messrs. Granveau and Keichinger in the July issue of *Revue Générale des Chemins de fer.*

SAFE DRIVING AWARDS TO SCOTTISH REGION MOTOR DRIVERS.—In the annual competition promoted by the Royal Society for the Prevention of Accidents, over 1,000 awards have been made to British Railways motor drivers in the Scottish Region in respect of the year 1953. The drivers receive their awards at presentation ceremonies held at various railway centres; they include 15 men with 19 years accident-free driving. A total of 93 drivers have driven for 10 years or more without accident.

SALE OF DUNDALK, NEWRY & GREENORE STATIONS.—Three stations, part of the remaining property of the defunct Dundalk, Newry & Greenore Railway, have been sold for £2,050. Quay Street Station, Dundalk, was sold for £805; the private residence attached to the station was sold earlier to its present occupier. Bush Station, including the station house, was sold for £625, and Bellurgan Station (with house), was sold for £620. Plots of land at other places on the line were sold for £140 and £200.

CRACK DETECTION BY FLUORESCENT LAMP.—Hanovia Limited, Slough, has developed a fluorescent lamp, known as Model 16, as a crack detector; the equipment is portable. Components of non-ferrous metal or plaster composition are sprayed or dipped with a fluid known as Glo-Mor, washed with carbon tetrachloride, and exposed to the lamp in semi-darkness. Cracks and flaws hold the ink and show as lines or spots. For magnetisable components Lu-Mor fluorescent magnetic ink is used, and is applied in the same way. Details of the equipment, and also other products of the firm, which includes the Hanovia water steriliser by ultra-violet-ray are given in a series of illustrated leaflets issued by the firm.

The Level Crossing Problem in Europe

Protective devices and attempts at standardisation

(By a correspondent)

IN the February 5 issue of *The Railway Gazette* reference was made to the inconvenience both to rail and road users of level crossings, and mention was made of the broad lines of protection afforded in different countries. Apart from the complete abolition of level crossings through construction of overline and underline bridges, the greatest protection seems to be given by the British practice, where public roads are concerned, of gates closing over both rail and road, and operated manually or electrically by the railway staff. This is costly, though less costly than the construction of bridges, and most countries have not felt it worthwhile to adopt the British practice. Indeed, in Great Britain itself there are some 22,000 occupation and accommodation crossings not protected in this way, though at most of these there are unmanned gates which are opened and closed by the road users themselves.

Degree of Protection

Some indication of the degree of protection afforded in various countries can be gained from the following figures:

Railway	Average number of level crossing accidents per million train-km.
British Railways	0·4
Italian State Railways	0·6
Danish State Railways	0·6
German Federal Railway	0·7
French National Railways	0·8
Swiss Federal Railways	1·2
Norwegian State Railways	1·4
Belgian National Railways	1·5
Swedish State Railways	1·6
Netherlands Railways	2·2
Class I Railways, U.S.A.	2·8
Japanese National Railways	4·0

These figures must be treated with some reserve; to appreciate fully the relative freedom from level crossing accidents of various railways, regard should be had to other factors, such as the number of level crossings relative to the route mileage of the railway concerned, the proportion of public to private crossings, the density of road traffic, the terrain, and so on. There is, nevertheless, no doubt that even were allowance made for these factors, the British position would still be comparatively favourable.

The general aim of railway administrations is to reduce, rather than increase, the cost of level crossing protection, and it is clear that no widespread extension of the gated and guarded type of public crossing can be anticipated. Where appropriate financial aid can be obtained from the State or from local authorities, the tendency is towards abolition of crossings by constructing overline or underline bridges. In other cases efforts are directed at finding the most economic and suitable combination of lights, alarm bells, and lifting barriers; the lights and bells are normally worked automatically by track circuits, whilst the automatic working of lifting barriers is being extended.

In most Continental countries busy level crossings near stations and junctions are protected by lifting barriers controlled by railway staff. Any policy calling for the substitution of automatically worked signals and barriers must, at the present stage of technical development, exclude such crossings, where highly complicated warning devices would be required.

At other public road crossings use has been made primarily of automatically worked flashing-light signals and preliminary warning signs, the design of which differs from country to country. That there has been a measure of uniformity of policy, even if not of technical details, is demonstrated by the available data on specific installations.

Installations on European Railways

In Denmark, for example, it is usual at a large number of crossings to find a preliminary warning sign, consisting of a red locomotive on a white triangular background, at a distance of 200 m. (656 ft.) from the level crossing. Midway between the preliminary sign and the crossing is a sign indicating that road vehicles must not exceed 20 km. (12·4 miles) an hour for the next 150 m. (492 ft.), that is, for a distance of 50 m. (164 ft.) past the start of the crossing. At a distance of 6-12 m. (19-39 ft.) from the crossing is a flashing signal. The detailed design of this has varied to some extent, but it consists essentially of two or three red flashing lights on an inverted blue triangle; the combination of lights indicates whether single or double tracks are ahead.

The general policy in Denmark has been the elimination of level crossings through the construction of under- and over-bridges. In 1920 the number of such bridges was 392; corresponding figures for the years 1940 and 1950 were 842 and 978 respectively.

In Norway there are 370 level crossings over public roads. Approximately 100 of these are protected by lifting barriers, six of which are train operated. A further 31 crossings are protected by automatically-operated light signals. These latter incorporate a preliminary sign similar to that in Denmark at a distance of 200 m. from the crossing. There is an intermediate sign 50 m. from the crossing, and finally a flashing-light signal located 5-8 m. (16-26 ft.) from the crossing; this consists of a red flashing light over a white flashing light, the latter giving a road clear signal and the former a warning of approaching trains.

Automatically-worked signals have only been developed in recent years in France. Experiments are now being carried out with automatically-controlled lights and half gates at four level crossings on the Bordeaux-Aurillac road, and a number of crossings have been equipped with a somewhat novel form of light warning. There is a preliminary warning sign 200 m. from the crossing similar to that in Denmark. An automatically worked flashing-light signal is placed 5 m. (16 ft.) from the crossing. A red-and-white post supports a grey board on which is painted a red and white striped St. Andrew's cross, and at the top of the board is an alarm bell. Above the board is one, or sometimes two, red flashing lights which come into operation, in addition to the bell, when a train is approaching. Above this again is a semi-circular disc, in two halves, bearing the words "Danger — Attention au Train." When no train is near the two halves of this sign are turned away from the road, but when the flashing lights are operating the sign is visible to road traffic.

In Western Germany the type of automatic signal most frequently installed before 1952 consisted of a red flashing light above a white flashing light, these two lights being mounted on a blackboard surrounded by a border of small reflectors; above the board was a form of St. Andrew's cross. In recent installations the white light has been omitted, the signal now incorporating a red flashing light with a St. Andrew's cross below on the same support. The signal is located 5 m. from the crossing. A preliminary warning sign is provided at a distance of 240 m. (787 ft.) from the crossing with two intermediate signs at the 160 m. (525 ft.) and 80 m. (262 ft.) mark. The preliminary and intermediate signs are duplicated and appear on each side of the road. Experiments are being carried out with train-actuated lifting half-barriers; the first of these was installed near Darmstadt last April.

Belgium again has a preliminary warning, very similar to that in Denmark, Norway and France, 200 m. before the crossing. There are three intermediate indications, 150 m., 100 m., and 50 m. respectively from the crossing; 5 m. from the crossing is a signal consisting of a red flashing light above a green flashing light, the former being a danger signal to road traffic and the latter a road clear signal. In addition, two white posts painted with four diagonal red stripes are located, one on each side of the road, at a distance of 3 m. from the crossing.

In so far as preliminary and intermediate warning signs are concerned, the position in the Netherlands is very similar to that in Germany as regards design, number and location; they are

also on both sides of the road as in Germany. The light signal, located 12 m. from the crossing incorporates red and white flashing lights alongside each other, with an orange light above them. The red light flashing indicates that a train is approaching and the white light indicates that it is safe for road traffic to cross. The orange light shines continually if the other lights are out of order; this latter light is visible to train drivers, so enabling early advice to be given of failures. At 3 m. from the crossing are warning fences fixed on each side of the road; they are not intended to act as barriers. A 20-km.p.h. speed restriction is enforced on road traffic over the crossing.

Work of Swedish Committee

Since the war much attention has been paid in Sweden to the replacement of ordinary warning signs at public level crossings by automatically worked flashing-light signals. A committee was appointed by the Swedish Government, and its report, published in 1948, reviewed existing practice and recommended improvements. Up to that time the light signal, located 8-12 m. from the crossing, consisted of a blue-white flashing light mounted over a red flashing light on a red and yellow post.

Of the 4,000 level crossings over public roads in 1948, some 2,500 were protected by manned gates or lifting barriers and 1,000 by flashing-light signals of the type mentioned. Since that time the signal design has been amended to include two red lamps flashing alternately. Above the flashing lights is a cross with the inscription "Look out for trains," and where applicable another sign "Two or more tracks." A small number of crossings have been fitted experimentally with automatically operated lifting barriers.

There is, in Sweden, a preliminary warning 200 m. and an intermediate sign 50 m. from the crossing.

International Co-operation

Two international organisations in Europe have been working towards the standardisation of automatic signalling at level crossings, namely, the International Union of Railways (U.I.C.) and the Economic Commission for Europe. A study group working under the auspices of the U.I.C., without being able to reach complete agreement on standardisation, was able to produce agreed proposals which are now awaiting the approval of the Inland Transport Committee at Geneva. The draft agreement will then be submitted to the various countries concerned for ratification.

The present proposals are that automatic flashing-light signals at crossings without gates must give warning of the approach of a train by means of a flashing red aspect or two aspects placed horizontally and flashing alternately. A St. Andrew's cross should also be visible and, if possible, this should be on the same support as the lights. Normally these signals should be on the traffic direction side of the road, but should be on both sides of the road where visibility or other conditions make this desirable.

The flashing red aspect indicates that it is not safe for road traffic to pass, and, if desired, an audible signal may also be used.

Normally, the absence of such indications prohibiting passage would permit a road user to pass with caution over the crossing, but if desired a positive passage free signal may be given. Where used, this should consist either of a flashing lunar white aspect or of a reflecting lunar white disc, and would make the taking of precautions by the road user unnecessary. If desired, lifting half barriers can be provided on each side of the crossing facing the respective traffic streams. In a horizontal position they give the same danger indication as the flashing red lights, and when raised they are an alternative to the positive passage free signal.

It is clear from the data given earlier on the types of signal found currently at level crossings that most railways in Europe would not experience any insuperable difficulty in conforming to the proposed standards.

HOLOPHANE HIGH-BAY LIGHTING UNIT.—A new 1,000-W. mercury high-bay industrial lighting unit has been developed by Holophane Limited for use in steelworks, heavy engineering shops and so on. The unit, which embodies a heat-resisting glass reflector, has been especially designed to suit the characteristics of the new 1,000-W. MB/V mercury discharge lamp and provides a broad intensive light distribution. The fitting is of robust construction, and has a cast aluminium top canopy and steel cover in which the reflector is sealed. Four metal straps forming part of the fitting assembly allow for supplementary strap suspension from the roof structure and for the provision of stirrup mounting where necessary.

RAIL COMMUNICATION WITH SHEPPEY RESTORED.—Normal train services over the Sittingbourne—Sheerness branch were restored on October 8, after repairs to the King's Ferry road-and-rail bridge which links the Isle of Sheppey with the mainland over the River Swale. The bridge, which includes a lifting span, was put out of action on October 3 when a vessel collided with it; damage to the casing made it impossible to drop the lifting span back into position.

B.T.H. EXHIBITS AT THE BAGHDAD TRADE FAIR.—The British Thomson-Houston Co. Ltd., Rugby, is exhibiting at the British Trade Fair to be held in Baghdad from October 25 to November 2. A wide range of electrical plant and equipment is being shown, including the Stavolt engine-driven alternator; electric motors from fractional horsepower sizes up to 20 h.p. industrial motors; various motor starters and control gear; and typical examples of distribution and industrial switchgear and transformers. Electronic equipment is also being exhibited as well as a model of one of the 18 400-h.p. diesel-electric locomotives supplied by BTH for Western Australia Government Railways. Another feature is the display of Mazda lamps and lighting equipment for industrial and commercial uses. Some of the latest Mazda equipment is being shown together with examples of the most up-to-date control gear.

NEW PATTERN MEDIUM DUTY TRUNKING.—A medium duty metal-clad distribution system which, with all the installation advantages of the heavy pattern, has a lower amperage capacity, has been designed by the General Electric Co. Ltd. The busbar capacity ranges from 75 to 200 amp. per bar. Equipment for the system consists essentially of two, three, or four hard-drawn copper busbars totally enclosed in sheet steel trunking and supported at frequent intervals by high-grade insulating panels. A visible and substantial external copper earth link is provided on the side of the trunking so that each length of trunking and all fittings can be electrically coupled and connected to give an efficient earth throughout the system. Spring contacts are provided at all outlet points to ensure that tap-off unit casings are earthed efficiently before contacts approach the live bars.

PRECISION SPOT WELDER.—The General Electric Co. Ltd. has evolved a precision spot welder for the mass production of small components such as the joining of very thin non-ferrous wires or strip. One of many applications for which the spot welder is used is in the assembly of Trico thermally-operated flasher switches, in which dissimilar non-ferrous metals have to be joined in wire to sheet form to make reliable electrical contacts. The wire is 32 s.w.g. copper nickel. It is welded at one end to beryllium copper strip 0·006 in. thick, and at the other end to mild steel of substantial section. Such is the accuracy with which the machine is controlled that the two welds can be accomplished using the same mean settings, no time being lost between welds in altering the controls. Because the welds are of very short duration—1/50th second—water cooling of the electrodes is not necessary. Essential features of the G.E.C. spot welder are continuously variable controls for current and pressure, each fitted with graduated scales, and electronic control of welding times between one and six cycles (0·02-0·12 secs.). To ensure that the exact performance of the machine once set up will be repeated, the welds are synchronised to start always at the same point in a supply cycle.

NEW SINO-RUSSIAN RAILWAYS.—Russia and China have agreed to begin work soon on a railway from Lanchow in China to Alma Ata, in the Soviet Union, via Ulumchi. Construction of a railway from Lanchow to Yunmin started in 1953. The two Governments, with Mongolia, have issued a joint declaration on the construction of a line from Tinmin, China, to Ulan Bator, Mongolia, and the establishment of direct connections between the three countries. An agreement on the construction of the railway was first signed on September 15, 1952. The line will be connected with the railway from Ulan Bator to the Soviet Union. The countries have agreed to complete the construction of the lines.

De-scaling by the Sodium Hydride Process

A metal de-scaling process claimed to avoid many disadvantages of pickling and other methods

THE sodium hydride process is claimed effectively to de-scale most metals, including all grades of stainless, heat-resisting, high-speed, structural alloy, carbon, and mild steels; nickel-iron, nickel-chrome resistance, and most copper and nickel alloys; steel forging (for removal of scale before machining); iron, steel, bronze, and aluminium castings (for removal of foundry sand); and steel wire (for the removal of drawing lubricants).

Application of the process is possible to all metals, except those with low melting points, and those, such as zinc and tin and their alloys, readily attacked by caustic soda. The process easily removes hot rolling, annealing, and heat treatment scale from most ferrous and non-ferrous metals. Wire is completely rid of soap and similar drawing lubricants leaving it suitable for bright annealing, without risk of staining. Iron, steel, bronze and aluminium castings are cleared of foundry sand, even in internal cavities, hard to reach by any other means.

The advantages claimed are:—

(1) Treated metal is unaffected. Unlike acid pickling, the sodium hydride process attacks the scale and not the underlying metal. Aluminium and its alloys are only very slightly attacked in the hydride bath. In the quenching bath there is a reaction which lightly etches the surface of the metal, but is of no practical consequence, in the majority of cases. This means that the metal cannot be over-pickled, and results in appreciable savings when processing expensive alloys.

(2) The process is rapid. Once the metal reaches the temperature of the de-scaling bath, the scale is reduced very rapidly—usually within one minute. For example the total immersion time for coils of rod weighing approximately 1 cwt. is only about 10 min.

(3) There are no corrosion problems. The plant is constructed of mild steel and has a long life. There are no corrosive fumes.

(4) The same bath suits all metals. The same reagent de-scales all metals to which the process is applicable.

(5) Hydrogen embrittlement is impossible. The metal while under treatment cannot absorb hydrogen and so become embrittled; the tendency is to drive off any hydrogen present in the metal.

(6) The reagent penetrates deeply. For example, coils of wire rod can be de-scaled throughout without removing their binding wires.

(7) Disposal of waste is simple, as the reagent is alkaline, and readily soluble in water.

About 2 per cent of sodium hydride in a bath of molten caustic soda reacts with oxides present on metal in the form of scale and reduces them to a finely divided metal powder, or sometimes to a loosely adhering flaky foil. Chromium oxide is the only known exception to this rule, being reduced to a lower oxide. This also adheres loosely, however, and can easily be removed. Sodium hydride is generated in the plant by a reaction between hydrogen in the form of cracked ammonia, and sodium.

The metal, which may be suspended from hooks, slung from a chain, or placed in a basket of strong wire mesh, is immersed in the bath of caustic soda containing sodium hydride, for slightly longer than it takes to attain the same temperature as the bath—i.e. in the range of 350-370° C.

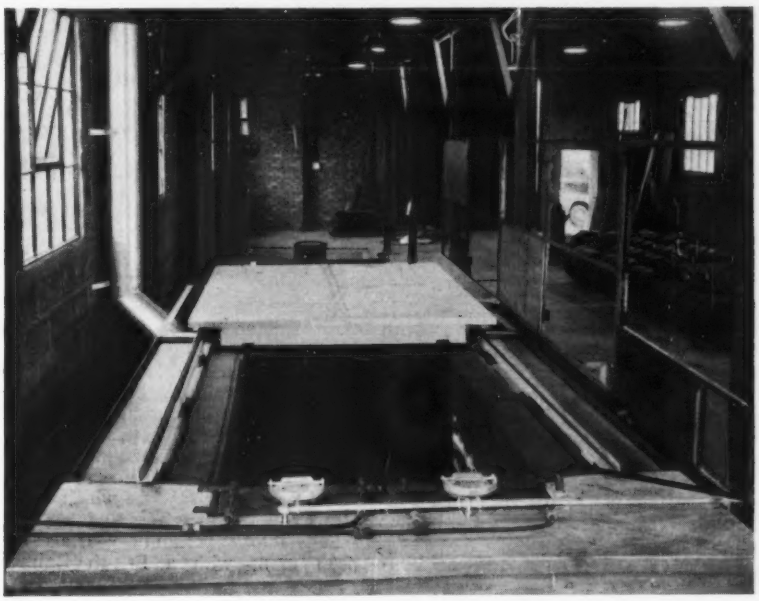
The temperature of the bath is controlled by a thermocouple and automatic regulator. It is often advantageous to pre-heat the metal, as this ensures that it is quite completely dry, and minimises immersion time.

It is then taken out, allowed to drain for a minute or two, and quenched in cold water. The steam generated by this operation usually removes most of the reduced scale from the surface. Any still adhering can be washed off by a high-pressure water jet or similar means. A final swill in hot water removes the last traces of caustic soda, and aids rapid drying.

With stainless steels and other alloys, when a bright finish is required, one of the normal acid dips for brightening may be applied with good results after water quenching.

Plant

The caustic soda/sodium hydride bath is an electric arc welded tank of mild steel. Various methods of heating the caustic soda may be used, depending on the available facilities. The choice includes external electric resistance heaters, immersed electrodes, and gas. Baths should be insulated against heat losses.



Caustic soda/sodium hydride bath. In the foreground are the sodium charging lids of the sodium hydride generator

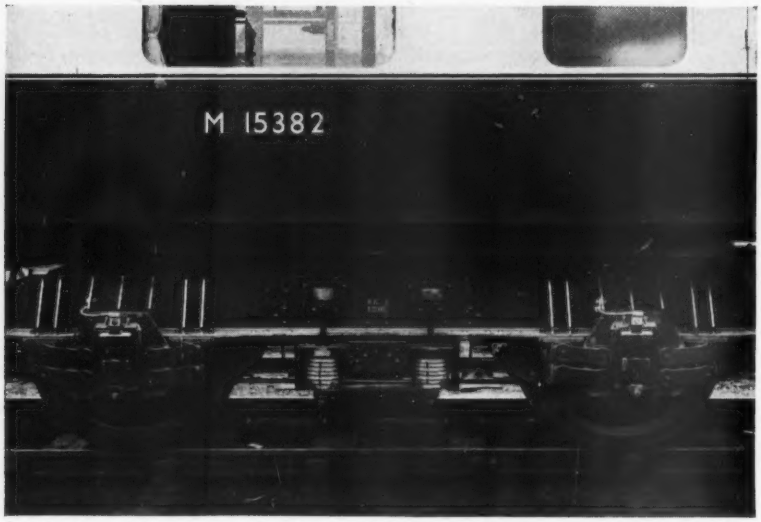
The sodium hydride generator consists of a welded mild-steel box, open at the bottom, with a hole at the top large enough to admit blocks of sodium, and covered by a lid. This box is immersed in the caustic soda for a depth of 12-15 in. projecting about 5-6 in. above it. Two mild steel tubes pass through the top of the generator box, and are carried about 9 in. below the liquid level. These serve to introduce the cracked ammonia, which bubbles up through the caustic soda and meets the layer of molten sodium floating on the surface inside the generator. For a small bath containing 1-2 tons of caustic soda, one generator is sufficient.

One or more I.C.I. ammonia crackers are needed; these are fed from cylinders of anhydrous ammonia. The

(*Continued on page* 434)

Rubber Suspension in British Railways Coaching Stock

Trials in the London Midland Region with specially designed suspension on the Andre-Neidhart system



Side view of bogie, showing Andre-Neidhart axlebox suspension and rubber compression springs on bolster

BRITISH RAILWAYS, London Midland Region, have been conducting experiments with a new development in the application of rubber, known as the Andre-Neidhart system, adapted to the suspension of railway vehicles. It was decided to conduct experiments with this type of suspension, adapting it in the first place to replace the conventional method of axlebox and bolster suspension.

A design was evolved, and the London Midland Region built two special bogies incorporating this design on the latest type of double-bolster standard bogie, also replacing the outer helical springs of the bolster by rubber compression springs. The attachment of the axleboxes to the bogie frame is entirely through rubber, there being no metal to metal contact, a feature which eliminates all wearing surfaces.

Satisfactory preliminary trials have been made with a British Railways standard corridor composite carriage, to which the bogies have been fitted. The trials, it is stated, have indicated that improved vertical riding would be achieved by the fitting of a much stiffer suspension than was usual with the conventional arrangement, and that the transverse cushioning effect was likely to give improved riding qualities. The suspension also eliminates a certain amount of wheel-rail joint noise because of the sound insulating effect.

All-Rubber Bogie Suspension

Trials are still continuing, and a carriage fitted with this method of suspension is operating on main-line passenger services to build up mileage, so as to ascertain the true dynamic effect on the rubber, and evaluate its life.

Meanwhile, designs are being prepared for an all-rubber bogie suspension. The design will include rubber units at the axleboxes and bolster, and also the fitting of rubber-bonded metal-to-metal swing links.

The design will completely eliminate all wearing surfaces, and the new type of swing link will also be effective as bolster transverse return units, all movement being taken through the rubber in shear. British Railways are giving consideration to the production of two further bogies incorporating all these designs.

The Andre Rubber Co. Ltd., of Surbiton, has acquired the sole licence for this country and the British Commonwealth for the Andre-Neidhart system.

De-scaling by the Sodium Hydride Process

(*Concluded from page* 433)

cracked ammonia is piped to the hydride generators.

Introduction of Sodium

Sodium, in the form of dry blocks, is fed into the hydride generators at intervals determined by the size of the plant and the amount of work passing through. The maximum rate of charging sodium to a generator is about 10½ lb. per hr.

To conserve heat when the plant is not in use, the bath is fitted with an insulated lid, lifted off when not required. A small amount of sludge which accumulates in operation can easily be removed if a sludge tray of mild steel sheet, perforated with holes ¼ in. dia., is kept in the bottom of the tank and occasionally lifted out and cleaned.

Continuous operation gives the most economical results, but when day-work alone is preferred, or the plant is not in use during weekends, its temperature should be lowered to 340°C., and a floating lid of mild steel in the form of a tray, put on the molten caustic soda to reduce its exposed area. If the plant is to be idle for long periods, the caustic soda may be allowed to solidify.

The sodium hydride process is licensed by Durtnall & Hipwell Limited, of Staines, from Imperial Chemical Industries Limited. In January, 1954, new premises were completed at Staines, and a sodium hydride plant had been installed.

This installation comprises a number of processing tanks capable of handling work which may be contained in vats 6ft. long, 4 ft. wide, and 4 ft. deep. The entire plant is screened in for safety reasons and is served by an overhead crane of 2 tons capacity. The plant is the first of its type in Great Britain to be operated solely as a contracting service for the engineering industry and allied trades.

Low Cost of Operation

The actual cost of operation is low, a very small labour force and expenditure on materials being required to treat effectively large quantities of metal in a very short time. The process requires to be fed with a steady flow of work to realise its economic potential. For this reason most sodium hydride installations operating today are to be found in large industrial plants where a continuous throughput of material is virtually guaranteed.

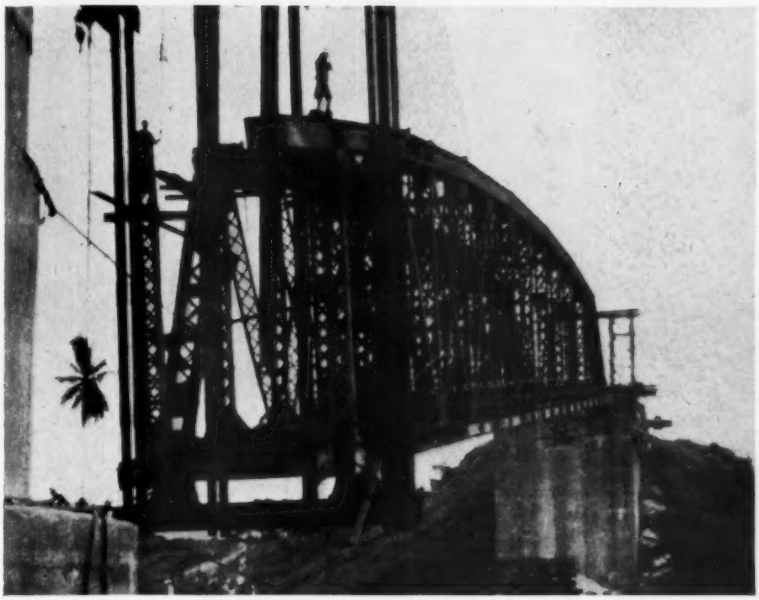
The plant at Staines, referred to on page 433, will effectively treat at least one ton of material of average mass in the space of one hr.

Materials and equipment being processed at Staines at the present time include: (*a*) de-scaling and de-rusting of crankshafts, camshafts, miscellaneous forgings, and copper wire and tubing; and (*b*) de-sanding of diesel engine crankcases, cylinders, and ancillary equipment and other ferrous castings.

K.G.S. BEARING CO. LTD. NEW LONDON OFFICE.—The K.G.S. Bearing Co. Ltd. has secured premises at 367, Uxbridge Road, London, which, it is hoped, after suitable alterations, will be opened during the early part of November. Mr. J. Squires, Junior, a director of the company, will be in charge.

Reconstruction of the Malayan East Coast Line

Remarkable work done in 1947-53



Lifting the northern span of Guillemard bridge with suspension links from jacks on temporary extension of adjacent span

TO delay the invading Japanese army, British forces destroyed all the major bridges on the East Coast Line of the Malayan Railway in 1941-42. However, the Japanese subsequently repaired those between (1) Gemas Junction (Mile 0), where the East and West Coast Lines meet, and Mentakab, 75¾ miles further north, and (2) the Siamese border and the Kelantan River, a distance of some 30 miles in the extreme North East. They also repaired part of the Guillemard Bridge over the Kelantan at Kusial, mile 294 from Gemas, and made some of the other bridges passable for road traffic. As they failed to lift the 250-ft. northern span of the Guillemard Bridge they could not use the line from that point southwards, and so they removed 200 miles of rails between Mentakab and Krai, mile 275, for equipping the Siam-Burma and other new constructions. Some of the steel bridge spans were also transferred to Siam.

After the war priority was given to the reconstruction of the West Coast lines, but on April 1, 1947, restoration of the track from Mentakab northwards and the reconstruction of two 200-ft. spans of the Bukit Betong Bridge over the Jelai River at mile 152 were both begun. The bridge work was completed in November, 1948, but all other work had previously been stopped by the Communist terrorist activities and no further work was possible in Pahang until August, 1952.

Meanwhile, rehabilitation had progressed in the vicinity of Kota Bharu in the north. Between May, 1947, and September, 1948, moreover, reconstruction of the Guillemard northern span and two other damaged bridges at Sungei Nal was undertaken. This involved the raising and repairing of two 250-ft. spans, weighing 400 tons, partly buried to a depth of 25 ft. in sand, and also two 100-ft. spans. A third 250-ft. span was damaged beyond repair, but its parts were salvaged and used to repair the other two 250-ft. spans, and it was replaced by one 150-ft. and one 100-ft. span.

A Minimum of Plant Used

So great were the hazards at that time and place, that the work could not be let out on contract and instead it was done departmentally. The engineering difficulties were great, as only untrained labour and the minimum of plant were available. In fact, the latter consisted of a 3-ton hand derrick and a battery of manual jacks, half of them damaged Japanese implements with locally hand-cut gears.

To raise the Guillemard span, where a 60-ft. flood-water rise was expected, the bold step was taken of temporarily extending the adjacent span as a 75-ft. cantilever to carry the jacks for lifting the fallen span. With such scanty facilities this was no mean feat. Simultaneously, the track between Kusial (mile 294) and Krai (mile 275) was being rehabilitated and this was subsequently carried on another 134 miles southwards to Kuala Lipis, reached in May, 1953. Throughout this length also some 7,650 l. ft. of steel bridge spans over 35 rivers and streams had to be repaired or replaced as quickly as possible to expedite the advance of railhead. At Kasuku an overhead cable-way was erected to convey materials, and at Bertam a high trestle bridge was built across the river on artificial islands constructed in the river bed.

With steel almost unobtainable and with the necessity for all possible economy, all available bridge steelwork was salvaged and repaired. At Manek Urai another cantilever lifting operation was carried out, and at Bertam a 250-ft.

Span at Sungei Nal, 250 ft. long, raised on falsework built up from river bed whilst being hauled into position

span lying on its side in the river was lifted by pontoons, righted, repaired and jacked up into position. Two 120-ft. spans at Kemubu were similarly treated, and at Bukit Betong two 200-ft. spans were re-erected on the substructure by jacking from a pile-staging driven into the river bed. Some of these jacking lifts were up to 60 ft. and there were many other delicate operations, such as the pontoon work at Bertam in a strong current and rapidly varying water level. The staff became extremely efficient and there were no fatal accidents.

From 1949 onwards construction work had to be strongly protected against attacks by Communist terrorists. Nevertheless, by June, 1953, through rail communication had been restored from Gemas to Tumpat, the extreme northern terminus 327 miles distant, but much of the track still required ballasting and fettling to make it serviceable for normal traffic.

The rails for the 200 miles of relaying were (*a*) recovered from Siam, 77 miles; (*b*) old rails from Johore unsuitable for main-line, 83 miles; and (*c*) new purchases, 40 miles. Altogether, 10,700 tons of rails had to be carried to Kelantan, mostly by rail through Siam. Also, 450,000 sleepers were required, but as primary hardwood timbers were not readily obtainable, secondary hardwood was mainly used.

The whole six-years' work had cost some $25,000,000, and had been a remarkable example of co-operation and teamwork in difficult and often dangerous conditions.

Bertam 250-ft. span after being lifted with pontoons from river bed, righted, and jacked up into position

Metre-Gauge Petrol Wagons for Rhaetian Railway

Improved design with cistern as part of underframe

THE development of oil-fired heating equipment and the construction of hydro-electric installations and of factories and growth of motor car and lorry traffic in Switzerland have created a demand for supplies of oil and petrol in the mountain districts and places in the Canton of Grisons frequented by tourists. Large quantities of these and similar products have to be delivered there.

Experience in prevailing conditions, including snow in winter and the mountainous nature of the country, has shown special rail transport arrangements to be particularly suited to this service, and this is provided, in summer and winter, among other places over the high Bernina Pass (at an altitude of 7,400 ft.) by the metre-gauge Rhaetian Railway. This system has recently added to the stock already in service a new series of tank wagons.

The tank cylinder is constructed as part of the underframe itself and is of the single-dome pattern. To enable heavy oil to be carried and to counteract low winter temperatures which are experienced at high altitudes, electric heating is provided. The type of vacuum brake in general use on the Rhaetian Railway is fitted.

With a tare weight of only 12·5 *tonnes*, these vehicles have a capacity of 25,000 litres (nearly 5,500 gal.) and are 32 ft. long overall.

These wagons were constructed by the Schweizerische Industriegesellschaft at Neuhausen.

Electrically-heated tank cars, showing construction of frame and cistern

HUNGERFORD BRIDGE DESIGN.—Plans and photographs of a design for a rebuilt Hungerford Bridge, including provision for a helicopter landing station, are being shown at an exhibition of the Lambeth Civic Society which is being held at the Festival Hall until October 21. The bridge, the south pier of which was damaged by a bomb during the war, would be rebuilt as envisaged under the Development Plan for London as a road bridge, and Charing Cross railway station would be demolished. The new bridge would have three levels, the top level being the landing station, to be known as Central London Heliport. The intermediate level would be for ordinary road traffic and the lowest level for fast through traffic. If the railway across the river is retained, the lowest level of the bridge could be used to carry the tracks and all road traffic would use the intermediate level.

Train-Controlled, Recorded Station Announcing System

Apparatus installed at Stratford for broadcasting of pre-selected announcements controlled by approaching trains

Push-buttons on panels flanking telephone keyboard in signalbox with (on left) microphone on extended arm

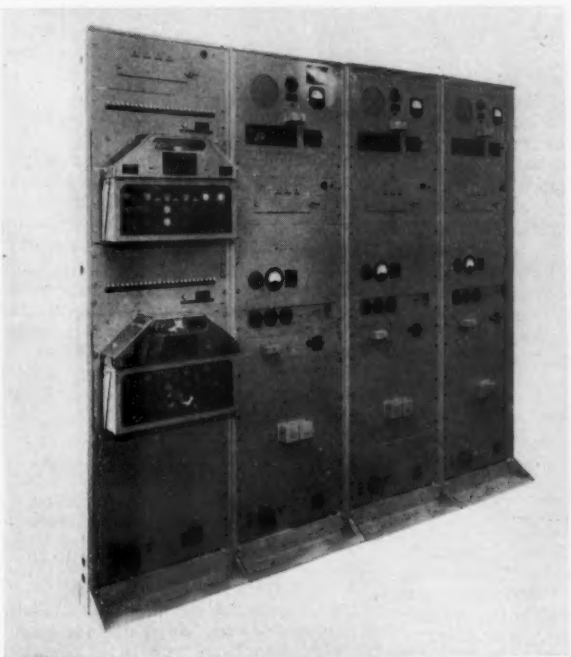
THE automatic train announcer system at Stratford Station, British Railways, Eastern Region, is now in operation for the broadcasting of recorded train announcements on all the down platforms. The appropriate announcement is selected by an operator in the signalbox and this selection is stored electrically until the train arrives at a predetermined distance from the station, when a "train approaching" announcement is automatically broadcast. On arrival at the platform and after a suitable time lapse to allow for the doors opening, a "train standing" announcement is given in a similar manner. During peak or abnormal periods when the headway does not allow time for the "approaching" portion to be broadcast, this portion is automatically omitted.

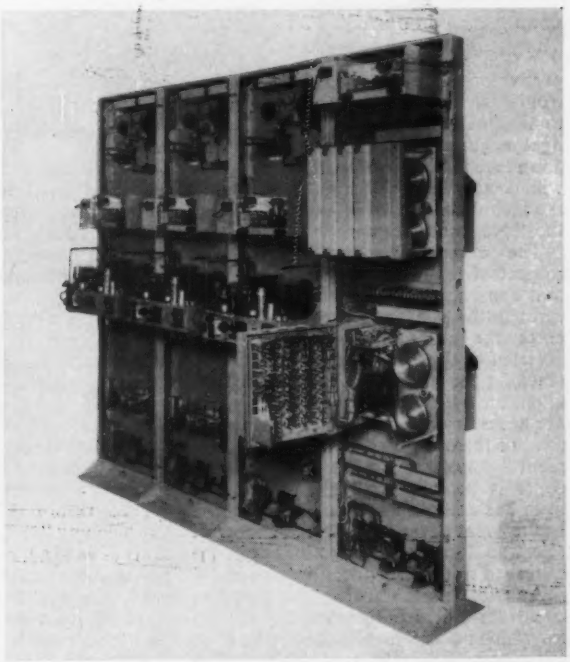
The equipment associated with the electric lines is independent of that for the main lines; announcements on both groups can be made simultaneously, as the platforms are sufficiently far apart to prevent any confusion.

The recorded announcements are numbered and are pre-selected by momentarily depressing the appropriate push-button mounted on a panel beside the telephone keyboard in the signalbox. Up to four pre-selections can be made and electrically stored in each platform group, with an illuminated lamp indicating the announcement number of each stored selection. When the announcement for a train is started, a red lamp is illuminated next to the respective storage indication and both lamps are extinguished when the train leaves the platform.

Selection of Announcements

With certain exceptions, a selection is made for every train that enters, or will enter, the controlling section of the line. Selections are made in the order that trains will arrive at the platform, irres-





(Left) Front view of main reproducing unit, showing two reproducers on standard rack (on extreme left), and three racks of amplifier equipment; (right) tape reproducers, with relay bridge exposed to show motor, uniselector, and drive mechanism

Loudspeaker in operation on platform on arrival of multiple-unit electric train

pective of the order of entering the controlling track circuit sections or routing to the platform. Non-stopping trains, light engines, and so on, for which no announcement is necessary, but which will occupy the platform track circuits are included in the selection by operating the " No announcement " key.

The exceptions mentioned are in respect of (*a*) the frequent goods trains that approach on a branch line and pass through the platform, and (*b*) trains that enter the controlling section but are diverted to the Woolwich branch before reaching the platform. To avoid undue attention by the operator, no selections are necessary for the trains in respect of (*a*). In the case of (*b*), " No announcement " selections are necessary, as the route is occasionally set up after the train has entered the controlling section. In the event of an alteration or incorrect selection the stored selections can be cancelled and fresh selections made.

An audible and visual warning is given if a train enters the controlling section for which no selection has been made. A selection can then be made at any time before arrival of the train at the platform, but if no time is available for the broadcasting of the " train approaching " portion, this is automatically omitted. Announcements for Hertford line trains which start from Stratford Station consist of a " train standing " portion only, and are broadcast either immediately the selection is made or immediately after any previously stored selections for arriving trains are cleared by those trains.

The announcements may be checked by means of a monitor loudspeaker and special or emergency announcements may be made by microphone to any or all platforms including those of the up lines.

Recording

The announcements for each group are recorded on a continuous loop of magnetic tape, 3 in. wide, with a capacity for 25 recording tracks. The " train approaching " and " train standing " portions of each announcement are recorded on separate tracks. The reproducing head is attached to the end of a rack actuated by a gear wheel fitted to the shaft of a modified two-way uniselector mechanism. On receipt of a " start " signal, the uniselector wipers move over the normal type of bank contact and search for the condition marking the required announcement; this rotation positions the reproducing head on the appropriate recorded track.

The tape is driven at a constant speed of 7½ in. per sec. by rollers and gearing, from a $\frac{1}{10}$ h.p. motor, and after passing through the reproducing head and main system capstan rollers is allowed to fall freely into one end of a casket so dimensioned that the tape is guided to form folds that are gently removed as it is extracted from the other end of the casket, whence it is again drawn to the reproducing head.

Thus about 30 ft. of tape is accommodated in a container 17 in. long by 7½ in. The casket, with tape, can be removed in a few seconds without dismantling the reproducing head. Two spare caskets, containing tapes with recorded announcements, are supplied with other spare components.

Two complete reproducers, with their associated relays, are mounted on a standard type rack 6 ft. high and 1 ft. 9 in. wide, with a power supply control panel. A lamp indication shows the recording track in use, and also facilities for local operation for maintenance purposes.

Amplifier Equipment

Three racks of amplifier equipment are provided, two for the recorded announcements and one for microphone announcements on the up platforms. Each rack is fitted with identical equipment consisting of a monitor loudspeaker and output level meter panel, switching panel, tape playback, preamplifier, power amplifier, relay panel and power supply control panel.

The switching panel provides a ready means for connecting the rack equipment to either reproducer and to any loudspeaker group. During maintenance operations, or in the event of a failure, service can be maintained to a busy platform by switching the reproducer and loudspeaker group to the infrequently used amplifier normally associated with the up platform.

All amplifiers are of the latest design, using the new Z.729 low noise pentode for the early stages and K.T.66 valves for output and each amplifier is self-contained with a power supply and rectifier circuit. Each power amplifier is fitted with a rotary switch and meter for checking the conditions of all valves. The mains supply is connected by a relay, with mercurial contacts, fitted on each rack, and operated from a mains switch on the monitor loudspeaker panel in the signalbox.

Operation

On the receipt of a " start " signal from the control apparatus, a uniselector rotates and is stopped at the marked bank contact, thus positioning the reproducing head on the required track. The tape motor is then started, and simultaneously, all high tension circuits are completed, via relays, on the amplifier rack associated with the particular reproducer, and the announcement is broadcast. The joining of the ends of the

(*Continued on page* 441)

RAILWAY NEWS SECTION

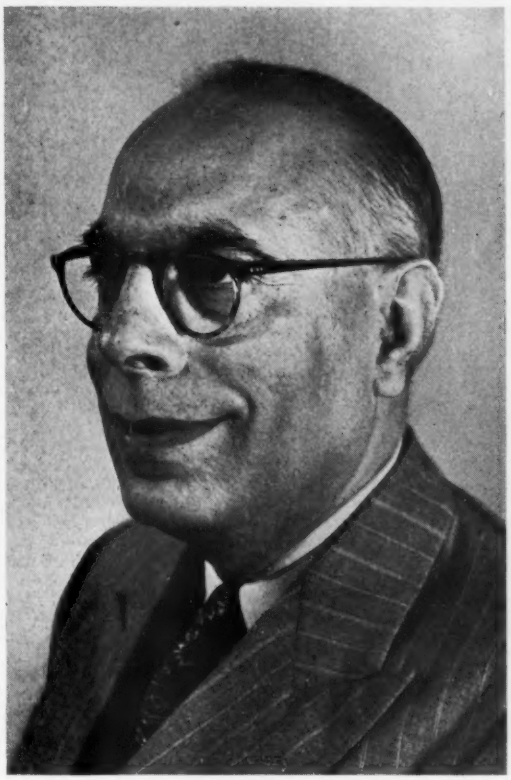
PERSONAL

Mr. H. P. Hira, General Manager of the Central Railway, India, has relinquished that position as a result of ill-health. He has been succeeded by Mr. A. Saldanha, Senior Deputy General Manager.

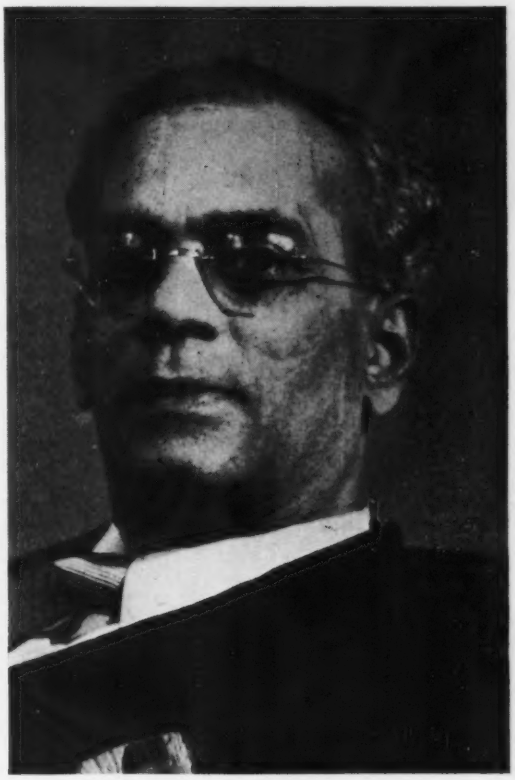
Mr. H. P. Hira, B.A., General Manager of the Central Railway, India, who, as recorded above, is relinquishing that position, was born on January 18, 1900, and educated at the Sind College and St. Xavier's College, Bombay. He took his B.A. degree in Bombay in 1919, and, after a brief course of training on the Great Western Railway at Paddington, he joined the Great Indian Peninsula Railway as a Traffic Probationer in 1925. Mr. Hira subsequently had charge of various divisions of the Commercial Department as Divisional Traffic Manager at Nagpur, Bombay, and Jhansi, and was later appointed Goods Superintendent, Wadi Bandar. In April, 1943, he was made Deputy Traffic Manager, and he served as Deputy General Manager (Food Supplies) from July, 1944, to April, 1946. In June, 1947, he became Chief Traffic Manager, and, in 1949, General Manager. His appointment as General Manager of the newly-formed Central Railway followed.

Mr. Dudley F. Cooper, Vice-Chairman of Docker Brothers, Birmingham, is retiring after 47 years in the service of that company.

Mr. A. Saldanha, M.A.(Cantab.), M.I.E. (India), J.P., who becomes General Manager of the Central Railway, India, was born in 1901 and educated at St. Xavier's High School, St. Xavier's College, Bombay, and as a Tata Scholar at Gonville and Caius College, Cambridge. After obtaining a First Class in the Mechanical Sciences Tripos, and becoming Senior Prizeman of his College in 1924, he joined Messrs. Rendel, Palmer & Tritton, Consulting Engineers, and, on completing a year's training, he returned to India. He was appointed Assistant Executive Engineer on the East Indian Railway in 1925, later becoming an Executive Engineer. Mr. Saldanha was transferred to the Great Indian Peninsula Railway in 1934, being appointed Engineer-in-Charge, Permanent Way & Stores, in 1935. He was subsequently responsible for various engineering divisions, officiated as Deputy Chief Engineer from 1943, and was promoted to be Chief Engineer in 1947. During his tenure of office in the last position, Mr. Saldanha was responsible for the execution of several outstanding postwar engineering projects, the most important of these being the removal of infringements in the Bhore and Thull Ghats, the construction of the new Down Line from Budni to Barkhera and the partial doubling of the Mathura-Delhi line. In March, 1952, he was appointed Senior Deputy General Manager of the newly-formed Central Railway. Mr. Saldanha was a delegate for the Indian Government to the International Railway Congress at Lucerne in 1947, and was President of the Bombay & Western Indian Section of the Permanent Way Institution from 1947 to 1952. He was appointed a Justice of the Peace in the State of Bombay in 1948. Mr. Saldanha was appointed Senior Deputy General Manager of the newly-formed Central Railway in 1952, and acted as General Manager for two months last year while Mr. Hira was on leave.



Mr. H. P. Hira
General Manager, Central Railway, India, who is retiring



Mr. A. Saldanha
Appointed General Manager, Central Railway, India

We regret to record the death, at the age of 78, of Sir William Gowers, Senior Crown Agent for the Colonies from 1932 until 1938.

We regret to record the death of Mr. Frank Gee, formerly Assistant Chief Mechanical Engineer of the Buenos Aires Great Southern and Buenos Aires Western railways.

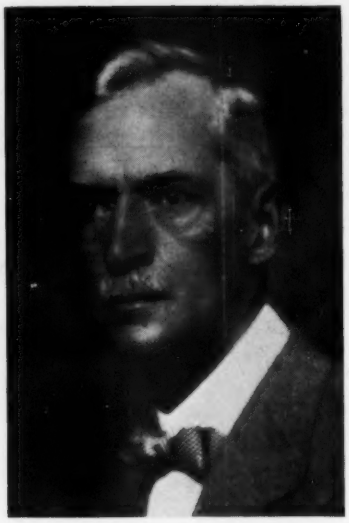
Mr. P. Kelvin-Johnson, who is a representative of industry, has been appointed a member of the Transport Users Consultative Committee for the South Eastern area.

Mr. George B. Howden has automatically vacated his position as Chairman of the Great Northern Railway Board at the end of his year of office, and has been succeeded by Mr. Percy Reynolds, Senior Member of the Eire representatives. When the appointments were made last year it was stated that Mr. Howden, who is also Chairman of the Ulster Transport Authority, would hold office as Chairman and Vice-Chairman in alternate years with the senior Eire member.

XUM

Mr. C. J. North,
Appointed District Motive Power Superintendent, Kentish Town, L.M. Region

Mr. E. C. Dewick
Estate & Rating Surveyor, Scottish Region, British Railways, 1948-54



The late Mr. John A. Zedoff
Stores Superintendent, Buenos Aires Great Southern Railway, 1926-31

Mr. C. J. North, Assistant District Motive Power Superintendent, Willesden, London Midland Region, British Railways, who, as recorded in our September 3 issue, has been appointed District Motive power Superintendent, Kentish Town, began his railway career on the former Midland Railway in 1913 at Saltley, where he commenced mechanical training in the Chief Mechanical Engineer's shops. After serving with the 16th Battalion of the Lancaster Fusiliers in the 1914-18 war, he returned to Tyseley on the former Great Western Railway, where he gained further experience. In 1926 Mr. North returned to Saltley, then absorbed in the L.M.S. organisation, and, two years later, became Running Shed Foreman at Lancaster (Green Ayre). In 1931 he became Foreman Fitter at Edge Hill, Liverpool, and held this position for nine years until, in 1940, he was appointed Head Office Mechanical Inspector, Divisional Office, Crewe. Four years later Mr. North became Assistant District Motive Power Superintendent, Swansea (Victoria), and, in 1946, he acted as Assistant District Motive Power Superintendent, Camden. Later in the same year he was appointed Assistant District Motive Power Superintendent, Willesden, the position he now vacates.

We regret to record the death of Mr. H. L. Wilkinson, Superintendent of the Line, Great Western Railway, 1933-36.

Mr. Albert Hallworth has been declared General Secretary-Elect by the Association of Locomotive Engineers & Firemen, after a ballot vote of the Society's membership. He will take over in February, 1956, on the retirement of Mr. J. G. Baty, the present General Secretary.

Mr. S. M. Pratt, Sack Superintendent, Lincoln, Eastern Region, British Railways, is retiring on October 16, after almost 47 years of service. He began his railway career in February, 1908, as a junior clerk in the Goods Manager's Office of the former Great Eastern Railway, and spent practically the first thirty years of his service in various positions in that office. Mr. Pratt was appointed to the position of Sack Superintendent, Lincoln, L.N.E.R., in October, 1939.

Mr. E. C. Dewick, F.R.I.C.S., F.A.I., Estate & Rating Surveyor, Scottish Region, British Railways, who, as recorded in our October 1 issue, retired on October 10, studied at the Regent Street Polytechnic, London, in the School of Architecture & Surveying, and is a Bronze Medallist of that institution. He entered railway service in 1903, when he joined the London & North Western Railway as a junior clerk in the Estate Department. During the 1914-18 war he served with the Royal Engineers (I.W.T.), being commissioned in December, 1916. On the amalgamation of the railways in 1923, he was appointed a surveyor in the London Divisional Estate Office, London Midland & Scottish Railway, and, in 1927, he was transferred to Crewe as District Estate Agent. After two and a half years he was appointed to a similar position for the Derby District. In 1944, Mr. Dewick went to Liverpool as District Estate Agent for the L.M.S.R. and Surveyor to the Cheshire Lines Committee, and, in 1946, he was transferred to Glasgow as Divisional Land & Estate Agent. His appointment as Divisional Estate & Rating Agent, Glasgow, followed in 1947, and he became Estate & Rating Surveyor, Scottish Region, British Railways, in 1948.

British Railways, London Midland Region, announces the following appointments:—

Mr. S. B. Lovegrove to be District Operating Superintendent, Liverpool (Lime Street).

Mr. R. Riley to be Staff Assistant to Manager, Irish Shipping Services, Euston, London Midland, Scottish, and Western Regions.

Mr. Andrew Earley, Transport Adviser to the British High Commissioner in Germany, who, as recorded in our October 8 issue, has been appointed Chief Ports Manager of the East African Railways & Harbours Administration, was entertained in Bonn on October 7, by Dr. Seebohm, the Federal Minister of Transport, and was presented with an inscribed silver cigarette box.

George Cohen, Sons & Co. Ltd., states that Mr. V. L. Hamilton has been appointed a Director of its subsidiary, Henry Osman & Co. Ltd.

We regret to record the death in Temperley, Argentina, at the age of 85, of Mr. John Axel Zedoff, Stores Superintendent of the former Buenos Aires Great Southern Railway from 1926 until 1931. Mr. Zedoff was born at Stockholm on May 12, 1869, and educated at the Skara Gymnasium in Sweden. He went to Argentina in July, 1888, and entered the service of the Buenos Aires & Rosario Railway as a clerk in the construction stores of the Sunchales-Tucuman extension of that system. Appointed Chief Clerk in 1890, he became Storekeeper in Rosario the following year. In April, 1892, owing to ill-health, he resigned his position and went to Europe, returning to the Argentina in October, 1895, when he re-entered the service of the Buenos Aires & Rosario Railway as a clerk in the Stores Department at Buenos Aires. In December, 1895, he transferred to the Buenos Aires Great Southern Railway, being appointed Chief of the Despatch Section of the Stores Department. In August, 1898, he was appointed Travelling Auditor, in August, 1900, Chief Clerk, and, on November 1, 1909, Chief Assistant to the Stores Superintendent. He was appointed Stores Superintendent on July 1, 1926.

Sayed Mubarak Zarroug

Her Majesty's Government held a luncheon at the Dorchester Hotel on October 6 in honour of Sayed Mubarak Zarroug, Sudanese Minister of Communications and Leader of the Sudan House of Representatives. Mr. Boyd-Carpenter, Minister of Transport & Civil Aviation, presided. Others present included:—

Messrs. David Gammans, M.P., A. D. Dodds-Parker, M.P., Commander R. Scott-Miller, M.P., Lord Latymer, Mr. C. G. Davies, Sayed Khalifa Mahgoub, Sir Gilmour Jenkins, Sir Angus Gillan, Sir James Robertson, Mr. J. R. Farquharson, Sir George Cribbett, Messrs. G. F. Stedman, P. E. Millbourn, and O. F. Gingell.

In the evening, the Agent for the Sudan gave a reception in honour of Sayed Mubarak Zarroug at which the guests included:—Messrs. Selwyn Lloyd, Q.C., M.P., and A. D. Dodds Parker, M.P. (Foreign Office), John Boyd-Carpenter, M.P., Malcolm S. McCorquodale, M.P.

Messrs. M. J. S. Clapham, and H. E. Adams (Imperial Chemical Industries Limi-

ted), J. G. Barker (Ruston & Hornsby Limited), E. S. Everitt (Ruston-Bucyrus Limited), R. W. Taylor (Crown Agents), H. A. A. While (United Steel Companies Limited).

Mr. T. A. Crowe and General G. S. Szlumper (North British Locomotive Co. Ltd.), Messrs. E. L. Denny and W. D. K. Marshall (William Denny Bros. Ltd.); E. W. Hanslip (Taylor Bros. & Co. Ltd.), G. E. Embleton (Gloucester Railway Carriage & Wagon Co. Ltd.), Sir Archibald Boyd and Mr. L. B. Alexander (Metropolitan-Cammell Carriage & Wagon Co. Ltd.).

Lt.-Colonel H. Gresham (Gresham & Craven Limited), Colonel H. E. Clarke, (Brown Bayley's Steel Works Limited), Messrs. Richard Lyttleton (The Steel Co. of Wales Ltd.), C. C. Waddington (Howell & Co. Ltd.), Roger Gresley (G. Stephenson & Co. Ltd.), T. Bullivant (British Ropes Limited), C. Carter and B. D. Nicholson (Indestructible Paint Co. Ltd.).

Sir George Nelson and Mr. L. H. Short (English Electric Co. Ltd.), Messrs. H. J. S. Moyses, P. Middlemas, C. L. Trask (Birmingham Railway Carriage & Wagon Co. Ltd.), Colonel K. Cantlie (Locomotive Manufacturers Association), Sir Thomas Spencer, Messrs. A. McVie and L. T. Hinton (Standard Telephones & Cables Limited).

Messrs. W. G. Ballard, R. E. Beal and N. W. Waite (British Insulated Callender's Cables Limited), P. E. Goodwin, E. G. Westray and J. A. Crowe (Ericsson Telephones Limited), F. C. Burstall, R. H. G. Lee and W. Titley (Automatic Telephone & Electric Co. Ltd.), A. L. Fielding (Office of Agent-General for New South Wales), F. C. Caish and F. G. Pheazey (Siemens Bros. & Co. Ltd.), J. Cooper and S. V. Stone (D. Wickham & Co. Ltd.), E. W. Greaves (English Steel Corporation Limited).

Messrs. J. R. Farquharson, R. J. Hillard, and B. B. Smith (Sudan Railways), C. G. Davies, G. D. Lampen, Sayed Khalifa Mahgoub, Messrs. R. C. Mayall, W. B. G. Swayne and W. N. Allan (Sudan Agency Staff).

Consequent on the retirement of Mr. F. A. A. Menzler, Chief Development & Research Officer, London Transport Executive, the following appointments and changes in organisation are announced by that body:—

The position of Chief Development & Research Officer is discontinued.

Mr. A. T. Wilford, Director of Research, now reports to the Executive through the Chairman; administrative matters relating to his office will be dealt with through the Secretary.

Mr. H. E. Styles, Superintendent of Laboratories, is appointed an Officer of the Executive, retaining his existing title. He will continue to report to the Director of Research.

Mr. J. D. C. Churchill, Planning Officer, now reports to the Secretary. The Planning Office will continue to carry out its existing functions except that matters relating to town and country planning proposals and allied subjects are transferred to the control of the Development Officer (renamed "Traffic Development Officer") in the Department of the Chief Commercial & Public Relations Officer.

The following appointments in the Department of the Chief Civil Engineer of the London Transport Executive have been announced:—

Office of the New Works Engineer

Mr. E. W. Gain, B.Sc.(Eng.), A.M.I.C.E. Senior Executive Assistant in the office of the New Works Engineer, has been appointed a Principal Executive Assistant, and will be in charge of constructional work with responsibility for any necessary co-ordination.

Mr. Gain, who is 49, joined London Transport in 1935, as a Technical Assistant in the Department of the Chief Engineer, and was engaged on Metropolitan Line improvements schemes. He was appointed a Senior Executive Assistant in 1950. Before joining London Transport, Mr. Gain obtained experience with public works contractors. During the 1939-45 war, he was commissioned in the Royal Engineers.

Office of the Works & Building Engineer

Mr. J. E. W. Hanscomb, L.R.I.B.A., Senior Executive Assistant in charge of building contract, survey and inspection work, has been appointed Principal Executive Assistant responsible for the co-ordination of the various activities of the Works & Building Section of the Chief Civil Engineer's Department.

Mr. Hanscomb, who is 53, entered the service of the L.C.C. Tramways Department in 1932, as Maintenance Assistant responsible for management of direct labour building maintenance. He was transferred to the London Passenger Transport Board in 1933, appointed Area Superintendent to the Works & Building Engineer in 1936, in which capacity he was in charge of the direct labour building maintenance of the Southern Area, and, in 1952, was appointed to his present position. During the war, Mr. Hanscomb was seconded to the Ministry of Aircraft Production for work in connection with the erection of new factories, and later was transferred to the Ministry of Works for special duties concerning the fabrication and erection of temporary houses.

Rear-Admiral (E) W. G. Cowland, C.B., R.N.(Retd.), has been appointed Deputy Chief Engineer, Turbo Changer Department (Gas Turbine Division) of D. Napier & Son Limited.

Mr. Geoffrey Stones is re-joining the staff of Transport Engineering & Equipment Limited (Kelbus), as Works Manager on October 18. He is now fully restored to health after an absence of over two years.

Mr. L. D. Goldsmith, B.Sc., A.R.C.S., F.R.I.C., Manager of the Battery Works at Witton of the General Electric Co. Ltd., has retired after 39 years of service with the company. He is succeeded by Mr. J. A. Walters, Manager of the company's Special Products Department at Head Office.

Colonel G. G. Mallinson, M.I.E.E., has retired from his position as Manager of the Newcastle-upon-Tyne branch of Johnson & Phillips, Limited. He will continue to serve the company as a consultant. Colonel Mallinson's successor at the Newcastle branch is Mr. A. C. Bryant, A.M.I.E.E.

We regret to record the death, at the age of 87, of Mr. David Keachie, M.I.Mech.E., J.P., a former Director & Works Manager of Albion Motors Limited. Mr. Keachie served his apprenticeship with the North British Locomotive Company as an engineer, and after some time in South Africa returned to Scotland to help Albion Motors produce its first car.

Mr. R. R. Whyte, M.B.E., B.Sc.(Eng). (Lond.) has now assumed control of the Germiston Works, Glasgow, of the Metropolitan-Vickers Electrical Co. Ltd. This is in addition to his present responsibilities as Superintendent, Small-Turbine Department at Trafford Park. The Germiston Works manufactures steam-turbine condensers and associated auxiliaries.

Train Controlled, Recorded Station Announcing System

(*Concluded from page* 438)

tape to form the loop is effected by a metal foil strip. This strip completes a circuit for the "stop" relay at the end of the operation, and the reproducer and amplifiers are returned to the condition of awaiting the next "start" signal.

The control apparatus referred to above consists of British Post Office-type telephone relays, and uniselectors.

This equipment performs the following functions:—(*a*) detection, discrimination, and storage of conditions given by trains approaching the station through the medium of the existing track circuits and train describer equipment; (*b*) storage of announcement selections made by the operator; (*c*) connection of appropriate "start" signals to the reproducer equipment; (*d*) omission of a "start" signal for the "train approaching" portion, when necessary; (*e*) facilities for cancelling, by the operator, of stored selections; (*f*) connection of a second "start" signal for the "train standing" portion, when a repetition of this portion, or an alternative portion, is required by the operator; and (*g*) provision of lamp and buzzer signals on the panels, such as "storage full" and "fuse alarm."

Each announcement selection is stored by positioning a uniselector on the appropriate bank contact; after which the conditions mentioned in (*a*) are connected in turn to these selection storage switches by a further uniselector known as the sequence switch and the "start" signals transmitted to the reproducer equipment.

Delay Relay

An adjustable delay relay allows for a suitable lapse of time between the train occupying the platform track and the doors, opening, before the "start" signal for the "train standing" portion of the announcement is transmitted. If a train is held at the platform unusually long, or if the "train standing" announcement needs correcting, this portion may be repeated, or an alternative given.

The microphone, mounted on an extending arm attached on left of the keyboard, is connected to a pre-amplifier at the top of the reproducer rack. The output of this pre-amplifier is connected, when required, to any or all of the platform amplifiers by the operation of relays controlled from the keyboards.

The amplifier equipment and the tape reproducers and adoption of a uniselector switch mechanism for positioning the reproducer head on any required track were designed, developed, supplied and installed by the General Electric Co. Ltd. to meet the specification and requirements of Mr. A. Moss, Signal & Telecommunications Engineer, British Railways, Eastern Region. The keyboards, control apparatus rack, and equipment were designed, manufactured, and installed and the whole work finally put into commission by the staff of the Eastern Region.

XUM

Staff & Labour Matters

Revised Pay Structure for Railway Staff

Footplate grades not included in new agreement: early discussion of means to improve efficiency

Sir Brian Robertson, Chairman of the British Transport Commission, presided over a meeting in London on October 8 between representatives of the Commission and of the three railway trade unions at which agreement was reached on the revision of the salaries and wages structure, excluding footplate staff.

The agreement is the culmination of negotiations arising out of the agreement made between the B.T.C. and the unions at a meeting held, under the aegis of the Minister of Labour, Sir Walter Monckton, on December 16, 1953, which provided for: (*a*) Implementation of the Railway Staff National Tribunal flat rate award of 4s. a week for adult male staff; (*b*) examination of the whole wage structure to correct anomalies and to give added incentives (including differentials) in desirable cases; (*c*) the Commission and the unions to confer at the same time to evolve ways of increasing efficiency by all appropriate means; and (*d*) a further improvement on a percentage basis of the standard rates in operation prior to the operation of the Railway Staff National Tribunal Award.

The improvements under (*a*) and (*d*) of this agreement were effective from December 6, 1953, and January 24, 1954, respectively, and those arising from the new agreement will operate from October 4, 1954, subject to ratification of date of operation by the N.U.R.

In the case of salaried staff it is agreed that the settlement is an interim one, and that there should be a thorough review of the salaries structure including the basis of classification.

The A.S.L.E.F. raised no objection to the revision of the agreements affected by the above.

A.S.L.E.F. Not Included

Footplate grades are excluded, because the unions' claims on their behalf are being referred to the Railway Staff National Tribunal.

Examples of the revised rates of pay are set out below:—

Grade	Rate of pay before 6.12.53	Rate of pay at 24.1.54	Revised Rate	Increase over Dec., 1953
	£ s.	£ s.	£ s.	£ s.
Clerk, Class 5—				
Age 18	239 15	254 0	255 0	15 5
Age 28 (max.)	390 15	414 0	420 0	29 5
Class 3 (max.)	471 15 (5th year)	500 0 (5th year)	510 0 (3rd year)	38 5
Special Class, Cat. "C" (max.)	752 15	798 0	815 0	62 5
	s. d.	s. d.	s. d.	s. d.
Porter	117 6	124 6	125 0 (*a*) 127 0 (*b*)	7 6 9 6
Guard (max.)	139 0 (5th year)	147 6	151 0 (4th year)	12 0
Ticket collector	131 0	139 0	141 0	10 0
Signalman, Class 3	134 6	142 6	147 0	12 6
Station foreman	139 0	147 6	151 0	12 0
Shunter	128 0	135 6	140 0	12 0
Checker	127 0	134 6	138 0	11 0
Lineman, Class 3	134 6	142 6	147 0	12 6
Lengthman (3rd year)	121 6	129 0	132 0	10 6

(London rates are 3s. higher for wages staff and £10 a year more for salaried staff)
(*a*) Commence at (*b*) After 1 year

Main Points of Settlement

Features of the settlement are:—(*a*) a shortening of the scales for salaried staff in Classes 4, 3, 2, and 1, by cutting out the intermediate rate; thus staff reach the maximum of their grade after two years instead of after four years; (*b*) a shortening of the guards' scale under which the maximum is attained in the fifth year of service in the grade instead of in the sixth year; and (*c*) wages staff in the bottom grade receive an extra 2s. a week after one year's service.

Productivity

The representatives of the three railway unions and Commission have reiterated their determination to ensure that every possible step shall be taken to implement fully the provision contained in the December, 1953, agreement to improve the efficiency of the railway industry.

To this end the representatives of the unions agree that an appropriate advice be sent to their members of the intention of the Commission to arrange for meetings to take place of all the local representatives of the staff with the appropriate officers of the British Railways Regions within the next four weeks. Such meetings will consider any outstanding questions concerning the increase of efficiency, and what further improvement in efficiency can be obtained by other suggestions in full joint consultation.

It is recognised that there may be some aspects of working or of arrangements which will need consideration at a higher level if efficiency is to be obtained. Discussions at national level shall be arranged to deal with such questions where appropriate.

The A.S.L.E.F. is wholeheartedly in support of maintaining and improving efficiency and raises no objections of principle to the above. It is ready at all times to co-operate with all the parties concerned to promote efficiency. However, at this juncture this union finds it necessary to submit to its Executive the above document as a resolution of Clause 3 of the December, 1953, agreement.

Engineers' Pay Claim

The Executive Council of the C.S.E.U. meeting in York on October 7 decided unanimously to submit claims immediately to the engineering and shipbuilding employers' federations for increases in pay of 10s. a week for labourers and 15s. a week for craftsmen. The grading of semi-skilled workers is to be discussed once agreement is reached on the rates of pay of the skilled and unskilled men. The cost of the claim is stated to be in the region of £100 m. per annum. The C.S.E.U. also proposes to ask for a revision of the holiday agreements in the two industries in order to remove alleged anomalies.

The C.S.E.U., with the N.U.R., is represented on the employees' side of the Railway Shopmen's National Council. Many shopmen are members of the C.S.E.U., and they will be watching very closely developments in the outside engineering industry.

International Internal Combustion Engine Congress

At a recent meeting of the British National Committee which is to send official delegates to the International Internal Combustion Engine Congress in The Hague next year, Mr. W. K. G. Allen, Joint Managing Director of W. H. Allen, Sons & Co. Ltd. of Bedford, was elected Chairman, and Mr. Malcolm Logan, Honorary Secretary. Mr. E. A. W. Hornett will act as Treasurer. The National Committee consists of representatives of six interested trade associations: the British Internal Combustion Engine Manufacturers' Association; the British Internal Combustion Engine Research Association; the National Association of Marine Enginebuilders; the National Forgemasters' Association; the Locomotive Manufacturers' Association; and the Diesel Engine Users' Association. The subject matter to be discussed at the Congress, which will be held from May 23-26, falls under two main headings:

Railway Traction. Present-day possibilities of the technique of the diesel traction engine;

Marine and Stationary Purposes. Possibilities of the diesel engine with a power, at one shaft, of more than 10,000 h.p., eventually with units not below 2,500 h.p.

The official congress programme has yet to be announced by the Permanent Committee, due to meet at The Hague on October 26. Printed programmes should be issued in December. All enquiries from those wishing to attend the Congress should be addressed to the Secretary of the National Committee, c/o British Internal Combustion Engine Manufacturers' Association, 6, Grafton Street, London, W.1, which will act as the permanent Secretariat of the British National Committee.

The charges for attending the Congress are expected to be approximately £10 per head for delegates and £7 per head for ladies. This will cover most of the activities shown in the provisional programme with the exception of those scheduled for May 27. From the provisional programme it appears that the inaugural session will be held in the Knights Hall in The Hague, and all following sessions in the Kurhaus Hotel, Scheveningen. The official languages of the Congress will be French and English.

An official banquet at the Kurhaus Hotel, Scheveningen, on May 26 will conclude the conference, but those attending the Congress will be able, on May 27, to visit factories and industries. The choice includes a demonstration of diesel equipment of the Netherlands Railways and a visit to the works of Werkspoor N.V.

Northern Ireland Fares Inquiry

Conclusion of six-day hearing before Northern Ireland Transport Tribunal

After a six-day hearing in Belfast, the Northern Ireland Transport Tribunal concluded on October 5 its inquiry into the application of the Ulster Transport Authority for a new passenger fares structure. The submissions of the Authority were reported in our October 8 issue.

It was objected by the representative of the Belfast Chambers of Commerce and the Association of Northern Ireland Chambers of Commerce that the proposed fares were unduly high and compared unfavourably with charges in Great Britain; the Tribunal was urged to decline the U.T.A. application for an Order confirming the proposals.

Mr. A. Morrison, Chief Officer, Special Duties, U.T.A., said in cross-examination that increases in taxation had been one of the main reasons for seeking to increase fares. A reduction of 1s. in the petrol tax would save the Authority £200,000 in a year. The Authority's ordinary single and return tickets, agreed Mr. Morrison, were generally higher than in other places. The Authority was concerned with the effect which its proposals would have on the development of Bangor and like places.

Sir Anthony Babington, Chairman of the Tribunal, pointed out, in the course of a submission by a representative of youth organisations, who stressed the importance to those bodies of keeping fares as low as possible, that once the Tribunal had fixed minimum fares it had no control over what the Authority did within that limit. Mr. C. A. Nicholson, counsel for the U.T.A., said that although the Authority was sympathetic towards youth movements it had to treat the public alike.

Effect of Proposals on Revenue

Mr. R. Carlisle, Assistant Chief Officer, Special Duties, U.T.A., said that he was not prepared to give any indication of the future policy of the Authority on excursion tickets.

It was no part of the scheme, said Mr. F. A. L. Harrison, counsel for the U.T.A., to increase the revenue of the Authority. If approved, the proposals would reduce its revenue by £11,500. The Authority had produced what it conceived to be the most equitable solution of the difficult problem of balancing the scales between the two main classes of the travelling public—season-ticket and ordinary travellers. The last increase of fares in June of this year, continued counsel, was forced by an increase of some £210,000 in the wage bill. The Authority had passed on to the public only about £165,000 of that amount, leaving itself to absorb by economies at least £45,000.

Unequally-shared Burden

The burden of providing transport services was not equally shared between season ticket and ordinary ticket holders. Seventy per cent of the receipts were produced by 51 per cent of those who travelled, and only 30 per cent produced by the remainder. Thus the ordinary ticket traveller was bearing an unfair and disproportionate amount of the total cost of the services.

Mr. Harrison asked that a date for implementing any scheme settled by the Tribunal should not be fixed without the Authority having the opportunity to say when it could conveniently be brought into force.

At the conclusion of the hearing, Sir Anthony Babington said that the Tribunal would announce its decision as soon as possible.

WITHDRAWAL OF SOUTHEND-TOWER HILL COACH SERVICE.—The coach service between Southend and Tower Hill, London, introduced by Victoria Coaches (Leigh-on-Sea) Limited on April 5 has been withdrawn because of insufficient patronage. It had been licensed because of alleged overcrowding of the Fenchurch Street-Southend railway services.

Inspection of Beyer-Garratt Locomotives for Rhodesia

Some of the guests, with directors and staff, at the Gorton Works of Beyer Peacock & Co. Ltd. on the occasion of the inspection on September 30 of class "20" 4-8-2 + 2-8-4 Beyer-Garratt locomotives under construction for Rhodesia Railways

XUM

Extension of German Main-Line Electrification

On October 3 electric working began between Nuremberg and Würzburg, bringing the total route mileage of electrified lines of the German Federal Railway to 1,196, about 6 per cent of the total, with numerous improvements in the train services. The gain in time for passenger trains generally is some 20 per cent and for goods 30-40 per cent, and proportionately greater where gradients are encountered. The increased speed of the goods trains has enabled shunting, for passenger trains to pass, to be eliminated. The full benefits of the change will not, however, be realised immediately, as sufficient rolling stock is not yet available.

Only two through main-line trains each way daily are being operated electrically; but the local services have been altered and all goods trains are now electrically hauled. The running times of the latter have been cut by as much as 40 min. between Nuremberg and Würzburg and 70 in the reverse direction. The elimination of shunting for overtaking movements will enable many goods trains to reach either Nuremberg or Würzburg 2 hr. earlier than previously, while up to 3 hr. will be gained by trains that formerly had to be routed round via Ansbach and Bamberg, but now can be put back on the direct route. The full benefit of the alteration will not be felt until next May, when all main-line trains will be electrically hauled.

Models of Rolling Stock for Pennine Electrification

Three half-inch scale models have been made to the instructions of the Public Relations & Publicity Officer, British Railways, London Midland Region, for exhibition and general publicity purposes in connection with the Manchester—Sheffield—Wath electrification.

The model in the accompanying illustration was manufactured by Cherry's (Surrey) Limited, is of a Co-Co mixed-traffic electric locomotive built at British Railways Gorton Works, with electrical equipment supplied by the Metropolitan-Vickers Electrical Co. Ltd., and was described in our June 11 issue.

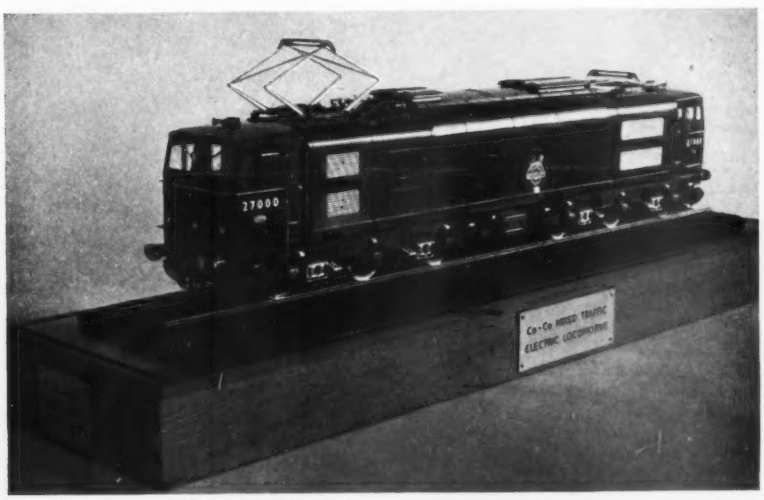
Of the other two models, one, of a Bo + Bo mixed-traffic locomotive, also built at Gorton and with Metrovick equipment, is the work of Bonds o' Euston Road Limited in collaboration with Edward Exley Limited. These locomotives were described in our issue of March 7, 1941.

The third model is the work of James Rogerson Limited. It is of a motor coach of the multiple-unit stock on the Manchester—Glossop services; these motor coaches, and the trailers, the subject of an article in our July 9 issue, were constructed by the Metropolitan-Cammell Carriage & Wagon Co. Ltd. and the driving trailers by the Birmingham Railway Carriage & Wagon Co. Ltd., with electrical equipment by the General Electric Co. Ltd.

Record Run by Western Region Boat Train

A special boat train of the Western Region conveying passengers from the ss. *City of Port Elizabeth* made a record run from Plymouth to Paddington on October 7. The load was five coaches, totalling 171 tons and the locomotive was No. 5069, *Isambard Kingdom Brunel*, of the "Castle" class. The following table shows the booked and actual times and the speeds attained:—

Distance Point to Point			Time booked	Time actual	Min. early	Speed m.p.h.
m. ch.			a.m.	a.m.		
— —		Plymouth Docks dep.	10.55	10.55	—	—
7 76		Hemerdon	11.10	11. 8	2	36·6
16 35		Totnes	11.30	11.25	5	58·0
8 59		Newton Abbot	11.42	11.36	6	47·6
			p.m.	p.m.		
20 15		Exeter St. Davids	12.5	11.58	7	55·0
				p.m.		
30 61		Taunton	12.32	12.26	6	65·9
27 45		Castle Cary	12.54	12.50½	3½	67·5
12 69		Blatchbridge Junction	1. 6	1. 1½	4½	70·1
5 23		Fairwood Junction	.—	1. 5½	—	79·3
2 37		Heywood Road Junction	1.11	—	—	—
28 12		Bedwyn	1.36	1.32	4	69·3
30 35		Reading General	2. 2	2. 0	2	65·2
17 42		Slough	2.17½	2.14	3½	75·1
18 36		Paddington (No. 8 platform) arr.	2.35	2.32	3	61·5
			hr. min.	hr. min.		m.p.h.
226. 65		Overall	3 40	3 37		62·7



Model of Co-Co mixed-traffic locomotive for Pennine electric services

Machinefabriek Alkmaar Anniversary

The Nederlandse Machinefabriek Alkmaar N.V., manufacturers of signal equipment and general engineers, recently celebrated its 75th anniversary. The Chairman of the board is Mr. J. H. Verstegen, a former Chief Signal Engineer of the Netherlands Railways, and the President is Mr. J. F. le Blansch.

The undertaking sprang from efforts made some years earlier in the then port of Den Helder by a Mr. C. B. Reitz to establish a small machine shop. Reitz and his associates had close relations with one of the early Dutch steamship companies. In 1875, however, the opening of the North Sea Canal caused Den Helder gradually to lose its importance and Reitz's concern disposed of its property there and decided to recommence activities in Alkmaar.

In July, 1879, the Alkmaar Ironworks undertaking was launched; a progressive policy was adopted and the undertaking prospered.

Signalling Manufacture Begun

Except for some equipment provided by the then Southwark firm of Stevens & Sons to railways built with English capital, such as the Netherlands Rhine Railway, any signalling apparatus there was then in Holland had been obtained from Germany; but in 1881, encouraged by an engineer of the Holland Railway Company named Taurel, the Alkmaar Works entered the signalling business, with its own designs of locking frame and so on, and carried out a great deal of work. In 1889, a particularly large installation was made at Amsterdam Central. The firm has continued to specialise in this work.

Both the Holland Railway Company and the company operating the State Railways gave orders to the firm, but in 1890 competition from outside Holland began to make itself felt. The railways in the Transvaal also obtained their signalling equipment from it, but after the South African war this ceased. Material also was supplied to the then Netherlands East Indies. By the end of the century it proved possible to issue an illustrated catalogue, and after that the manufacture of apparatus of the German Siemens pattern was undertaken, including electric block mechanism of the magneto type, still widely used in Holland and adjacent countries. Extensions to premises were made and other branches of work undertaken, including gas and oil engines.

In 1909, a beginning was made with power signalling with an electric installation at Rosendaal. The 1914 war, although Holland was neutral, resulted in material and manpower shortages. There was the probability of the railways manufacturing their own signalling, but in 1919 the State lines placed an order for an electric power installation differing in some respects from the conventional German types. The slump of 1921 brought many economic difficulties but in 1926 an improvement set in. An agreement was concluded with Siemens & Halske and new lines of business entered on.

In 1937 the firm was re-organised, and a former Signal Engineer of the Netherlands Railways, the late Mr. G. J. de Vos van Nederveen Cappel, became President; Mr. J. F. le Blansch succeeded him in 1942. During the second world war much of the machinery and equipment was removed to a place of safety which made it possible to bring the plant back into production rapidly after the end of hostilities.

Plans worked out during the war for resignalling the Netherlands Railways led to a committee visiting America and an arrangement being entered into under which the General Railway Signal Company of Rochester, N.Y., granted licences to a new undertaking, Spoor Sein Industrie, with the Philips telecommunications concern at Eindhoven, and the Alkmaar factory, as manufacturing sub-contractors.

Contracts & Tenders

The Calcutta Port Trust is reported to have ordered from a Japanese locomotive builder ten of the standard 0-6-2T steam locomotives at a total price of £167,190. Another ten of these locomotives will be required under the second stage of a five-year programme as announced in our August 27 issue.

British United Traction Limited has received an order for 43 sets of power equipment and 21 sets of trailer car equipment for incorporation in a further batch of multiple-unit lightweight diesel trains to be constructed by British Railways. Each power car will embody two 150 h.p. diesel engines with mechanical transmission. The cars will be designed and built at Swindon Works.

The Canadian National Railways have ordered 110 70-ton flat wagons from the Canadian Car & Foundry Company. They are the first of such wagons to be ordered by the C.N.R. for service in Canada. The specially-treated timber flooring will be spaced to allow for drainage. Wheels of rolled steel rather than cast iron are specified and a universal slack adjuster is added for braking. Leading strap anchors will facilitate the handling of loads held together by steel bands.

The High Commissioner for India invites tenders for fireboxes and components, and laminated springs. Details appear under Official Notices on page 448.

According to the Special Register Information Service of the Export Services Branch, Board of Trade, the Ports, Railways & Transport Department, Lourenço Marques, Mozambique, is calling for tenders for one system of automatic electric railway points, traffic control installation and signalling equipment. Tenders will close on January 17, 1955. A copy of the tender document (in Portuguese) is available for loan to United Kingdom firms in order of receipt of application to the Branch (Lacon House, Theobalds Road, W.C.1). Local representation is essential.

According to the Special Register Information Service, Export Services Branch, Board of Trade, the New South Wales Railways are calling for rolling stock as follows:—

Three two-level sleeping cars
Seven twinette sleeping cars
Three sitting cars (first class)
Three sitting cars (second class)
Two sitting cars with staff compartment (second class)
Three buffet-diner cars
Three power and brake vans

Principal Dimensions

Length over gangway castings (uncoupled)	77 ft. 3½ in.
Length over roof mouldings	75 ft. 1 in.
Length over body end framing	75 ft.
Length over headstocks	74 ft. 6 in.
Width over roof mouldings	9 ft. 8½ in.
Width over bodyside framing	9 ft. 7½ in.
Width over solebars	9 ft. 6½ on.
Height from rail to top of roof	13 ft. 2½ in.
Height from rail to top of body cantrail	10 ft. 10⅜ in.
Height from rail to floor	4 ft. 1⅜ in.
Height from rail to centre line of drawgear	2 ft. 11 in.
Height from rail to top of buffer beam	4 ft. 1 in.
Distance between centres of buffer beam plungers	4 ft. 5 in.
Centres of bogies	53 ft.

Tenders on the prescribed form, with the necessary deposit, must be enclosed in a sealed envelope marked "Tender for Twenty-four 75-ft. Steel Cars," and addressed to the Commissioner for Railways, New South Wales, 19, York Street, Sydney. The closing date is December 15. A copy of the tender documents, with specification, drawings, and conditions of tender, may be borrowed by United Kingdom firms on application to the Branch (Lacon House, Theobalds Road, W.C.1).

The Director General of Supplies and Disposals, New Delhi, is inviting tenders for 1,120 engine brake blocks for classes "SG/C," "SG/C1," "SG/C2," SG/S".

Tenders are to be submitted to the Director General of Industries & Supplies, Shahjahan Road (Section SRI), New Delhi, quoting reference SRI/16842-E/11. They will be received up to 10 a.m. on November 8. Forms of tender are only available for purchase in India from the Deputy Director General (Supplies), Directorate General of Supplies & Disposals, New Delhi, Director of Supplies & Disposals, Bombay or Calcutta, Deputy Director Supplies & Disposals, Madras.

If the date for the receipt of tenders does not allow sufficient time for tenderers to obtain tender forms from India, they may submit their quotation to India in their own letter form or by telegram so long as all essential particulars are given and provided they simultaneously apply for the tender forms and return them duly completed as quickly as possible on the basis of advance quotations submitted.

A copy of the tender form can be examined at the India Store Department, 32-44, Edgware Road, W.2, on application to the "CDN" Branch and the drawing may be seen at the offices of Hodges Bennett & Company, 59-60 Petty France, London, S.W.1., from whom copies may be obtained at a fixed price per sheet.

Notes and News

Vacancies for Draughtsmen.—Applications are invited for one mechanical draughtsman, and two carriage and wagon draughtsmen, required by Coras Iompair Eireann, Dublin. See Official Notices on page 448.

Vacancies for Designing Civil Engineers.—Applications are invited from persons desiring to join the service of the Commissioner for Railways, Brisbane, Queensland, Australia, as designing civil engineer, chief engineer's branch (two required). See Official Notices on page 448.

The Southern Railway Dramatic Society.—The next London production of the Southern Railway Dramatic Society will be held at the Scala Theatre, Charlotte Street, London, W.1, on Tuesday, November 16, at 7 p.m. The play to be presented on this occasion is "The Holly and the Ivy" by Wynyard Browne.

Institution of Mechanical Engineers: Nineteenth Parsons Memorial Lecture.—The Nineteenth Parsons Memorial Lecture on "Factors influencing the continuing development of the steam turbine," by Mr. F. Dollia, will be delivered before the Institution of Mechanical Engineers, 1, Birdcage Walk, Westminster, S.W.1, on Tuesday, October 19, at 6.45 p.m.

Cost of Repairing Hedjaz Railway.—A committee which has been considering the reconstruction of the derelict section of the Hedjaz Railway between Maan, in Jordan, and Medina, in Saudi Arabia, is to recommend to the Governments of Saudi Arabia, Syria, and Jordan that it be repaired at an estimated cost of about £3,350,000. The Hedjaz Railway formed the subject of an editorial comment in our September 9 issue.

The Northern Flexible Centre.—To meet the demands made on the flexible advisory service of the Compoflex Co. Ltd. by industry in the Midlands and North, the company has opened a Northern Flexible Centre at its factory in Huddersfield Road, Oldham. The centre, which was opened on October 6, is staffed by a team which can give advice on the most suitable flexible tube or hose to use in any given situation. A development section has also been started in Oldham, to deal with the design of special flexibles for particular projects. The first flexible centre was opened by the Compoflex Co. Ltd. at its head office at 26, Grosvenor Gardens, London, S.W.1, in 1952.

John Brown & Co. Ltd.—Lord Aberconway, Chairman of John Brown & Co. Ltd., presiding at the annual general meeting of the company on October 1, said that the consolidated balance sheet showed the strong position of the company and its subsidiaries. After provision of nearly £500,000 for depreciation and more than £1,000,000 for taxation, a profit of £770,000 remained for the year up to March 31 last, an increase of about £71,000 over the previous year. Of subsidiary companies, Wickman Limited had a successful year, with an increase in sales of machines of the company's own manufacture. Firth Brown Tools Limited, though less busy and less profitable than in the previous year, traded successfully. The whole of the capital of Cravens Railway Carriage & Wagon Co. Ltd., which has changed its name to Cravens Limited, is now owned

XUM

by John Brown & Co. Ltd.; Cravens Limited was fully occupied during the year and still has on hand substantial orders for rolling stock. Keen competition came from Continental makers prepared to offer relatively long-term credits. During the past few years Cravens Limited has devoted special attention to lightweight rolling stock; it completed during the year its first diesel-mechanical railcar, whose running trials were most satisfactory.

Fredk. Town & Sons Ltd. Purchase.—Thos. W. Ward Limited has purchased the entire share capital of Fredk. Town & Sons Ltd., of Halifax, machine tool manufacturers. Mr. Harold Vernon and Mr. G. Stuart Wood (directors of Thos. W. Ward Limited) have been appointed to the board and Mr. Harold Vernon has been appointed Chairman & Managing Director.

Institute of Transport, Northern Ireland Section.—For the opening session of the season the Northern Ireland Section of the Institute of Transport over 50 members travelled to Dublin by the G.N.R. "Enterprise." On arrival they were met by Mr. T. C. Courtney, and other members of the Irish Section. Accompanied by members of the Irish section, parties visited Collinstown Airport, Dublin Port and Docks, and the Inchicore Works of C.I.E. Officers present included Mr. J. Mackle, Chairman, and Mr. R. L. Streight, Secretary of the Northern Ireland Section.

Neon Sign at Manchester Central.—The neon sign in the accompanying illustrations has been erected at Manchester Central Station to the requirements of the Public Relations & Publicity Officer, London Midland Region. It was produced and fixed by S. Newton & Co. Ltd., of Salford. By day the sign appears as two "British Railways" totems white-faced with crimson returns and lettering flanking the words "Central Station" in the same colour scheme, the letters being 42 in. high. At night the totems are lit by fluorescent white tubes to the borders and outlines with ruby red letters. The main lettering is in ruby red single-line recessed 115 mm. neon tubing.

Train Auto Alarm System in Malaya.—An acknowledgment of the work of the Telecommunications Department of Malaya in the development of the train auto alarm system described in the article in our March 26 issue, was made by the author of the article, Mr. J. P. Cunliffe, M.I.R.S.E., Engineer (Signal & Telegraph), Malayan Railway, in the article as sent to us. It is regretted that in curtailing the article for reasons of space, this acknowledgment was inadvertently omitted from the text.

Railway Students' Association: Presidential Address.—The opening meeting of the Railway Students' Association will be held at the London School of Economics & Political Science, Houghton Street, London, W.C.2, on Wednesday, October 27, at 6.30 p.m., when Sir Reginald Wilson will deliver his Presidential Address. The chair will be taken on this occasion by Mr. David Blee, Chief of Commercial Services, British Transport Commission, the retiring President. The annual dinner and dance of the Association will be held at the London Transport (South Kensington) Club, on the evening of Wednesday, December 1.

Growing Demand for Saunders Valve Company Products.—The statement by Mr. J. C. Billingham, Chairman of the Saunders Valve Co. Ltd., points out that the trading profits for the year to April 30, 1954, fell somewhat short of those of the previous year, being £204,303, compared with £229,603. This is attributed mainly to the passing of the artificial position in 1952—53, when orders and deliveries, particularly from overseas, to some extent exceeded current consumption. The net profit available for distribution totals £87,081 compared with £73,017 a year ago. The net amount required to pay the dividend of 20 per cent which is recommended is £27,500 and the profits tax thereon requires £10,000. Mr. Billingham reports an expansion of orders booked in recent months, largely overseas. There is a growing demand for the company's products on account both of the tendency for industrial processes to be controlled automatically and of the increased range of services which new materials make it possible for these products to control.

Davy & United Engineering Co. Ltd.—At the annual general meeting of Davy & United Engineering Co. Ltd. on October 1, Mr. D. F. Campbell, Chairman, presiding, said that the trading profits of the group were £551,330, an increase of £109,000. After charging taxation, the net profit for the year ended March 31, 1954, was £128,697, or almost unchanged. The year produced the highest turnover in the company's history. The Chairman stated that the order book was still substantial and that within the last few weeks an important contract had been received from Dorman, Long & Co. Ltd. for a 52-in. blooming mill for its new Lackenby works.

Muir-Hill Exhibits at Olympia.—E. Boydell & Co. Ltd., of Old Trafford, Manchester, will be exhibiting the latest developments in its range of bulk material handling equipment at the Public Works Exhibition to be held at Olympia, London, W.14, November 15-20. Among the machines on display will be the Muir-Hill Supalift loader with 14 ft. 6 in. clearance under the lip of the tipped bucket when fully raised. This clearance will be demonstrated on the stand by showing the Supalift with its standard ¾ cu. yd. bucket tipped over the lip of an artificial hopper fully 14 ft. 6 in. in height. In addition the loader features the Muir-Hill patented double centre, three-point suspension system which provides the extra degree of stability needed to offset the increased loading height. Also on display will be the Muir-Hill 10·5 cu. ft. small industrial hydraulic loader, the LH-1. Because of its compact dimensions the LH-1 is specially suitable for working in confined spaces, particularly where a high degree of manœuvrability is required.

Neon sign at Manchester Central, London Midland Region; at night the main lettering is ruby-red

Among the Muir-Hill dumpers on view will be the 3 cu. yd. model, the 10B, which incorporates an instantaneous gravity tip and the Muir-Hill patented rotating seat and steering, enabling the machine to operate in either direction with equal facility. All the above machines will be fitted with diesel engines, as is now standard practice throughout the entire Muir-Hill range.

Acquisition of Edward Mercer Limited Interests.—Samuel Marsden & Son Ltd., of Manchester, have acquired the interests of Edward Mercer Limited, of Hollinwood, Oldham. Mr. F. Lord, Managing Director of Samuel Marsden & Son Ltd., continues to direct the sales policy of the companies, and Mr. A. Mercer, who joins the board of Samuel Marsden & Son Ltd., will be particularly responsible for sales at Hollinwood. Both companies have recently installed modern forging plant, and with their joint resources now are well equipped for production of all types of hot and cold forged nuts and bolts.

Gloucester Railway Carriage & Wagon Co. Ltd. Results.—The output of the Gloucester Railway Carriage & Wagon Co. Ltd. for the year ended May 31, 1954, exceeded £4,250,000, a further record. Most of the production was for overseas. Consolidated trading profits increased to £337,496, compared with £319,494 for the previous year. Total income was £380,212 (£349,521), and included surplus tax provisions of £22,543 (£8,251). Net profits were £128,841 (£125,521) after tax of £150,944 (£146,600). The total dividend is 11¼ per cent (10 per cent), absorbing £67,947 (£56,765).

George Cohen Sons & Co. Ltd. Exhibits at Olympia.—Typical examples of equipment available from its hire fleet will be displayed at the Public Works Exhibition, Olympia, on 15—20 November, by George Cohen Sons & Co. Ltd. The equipment includes a Jones K.L. 44, diesel-driven mobile crane mounted on crawler tracks; the crane is fitted with a 50-ft. jib, and has a maximum capacity of four tons. Other exhibits will include a two-tool, diesel-engine driven, portable air compressor of 110 cu. ft. capacity, complete with hose and tools; a 6/8 tons capacity, diesel-driven, three-roll, road roller, with a diesel-driven concrete mixer with power-loaded hopper and automatic water tank; and Nash 10 and 8 type diesel-driven tractor dumpers of 10 and 8 cu. ft. respectively.

National Helicopter Network.—A contract was signed in London last week by Lord Douglas of Kirtleside, Chairman of British European Airways, with Westland Aircraft, to buy two Westland-Sikorsky S55 helicopters for the London Airport-South Bank service which commences next April. It is proposed to operate eight services a day at a fare provisionally fixed at 30s. The journey will follow the course of the Thames and will occupy 17 min. Lord Douglas said that B.E.A. had now mapped out a possible network of domestic and short-stage international routes to be operated by a 45-50 seat helicopter bus when such a machine became available. He did not think that this could be before 1958, and even then it was likely to be a machine of American design. It was unlikely that the network could be operated in full for at least 10 years. The map shows international services from London to Paris (1 hr. 45 min.), Brussels (1 hr. 41 min.), and Amsterdam (1 hr. 48 min.). Internal routes include London-Birmingham (1 hr.), London-Manchester (1 hr. 16 min.), Nottingham-Sheffield (32 min.) and Liverpool-Glasgow (1 hr. 25 min.).

W-D Liquid Soap Dispenser.—A liquid soap dispenser, some 40,000 of which are stated to have been purchased by the British Transport Commission for fitting to carriage stock on British Railways, has been evolved by Waddington & Duval, Limited, 35, West Ham, London, S.W.18. The dispenser, known as the W-D, is claimed to be tamper proof. It has a circular aperture surrounding a plunger,

The W-D soap dispenser which operates by the pressure of the plunger which is self-lubricating

which when pressed ejects 0·8 c.c. of liquid soap; the dispenser holds sufficient soap for 200 washes. The plunger, which is the only moving part, is self-lubricating. The body is pressure die cast in unbreakable Mazak III zinc in polish chrome-plated finish on a copper nickel base.

Murex Limited Satisfactory Results.—The statement by Sir Arthur Smout, Chairman of Murex Limited, circulated with the company's report and accounts, shows that the consolidated trading profits for the year ended April 30, 1954, were £975,000 compared with £1,140,000 for the previous year. After transfers to and from reserves and providing for the annual dividend of 15 per cent recommended on the ordinary stock, the balance carried forward is substantially the same as a year ago. The report and accounts were adopted at the annual general meeting on September 29, when the final dividend of 9 per cent, making 15 per cent for the year, was approved.

Sheepbridge Engineering Products in Satisfactory Demand.—The annual general meeting of Sheepbridge Engineering Limited was held on September 29 in Sheffield, Mr. A. V. Nicolle, chairman of the company, presiding. In his statement circulated with the report and accounts, he said that although business in many lines increased substantially during the latter part of the 12 months ended March 31, 1954, profit margins did not recover proportionately and were in many cases decreased through increases in wages and costs of materials not passed on to the customer. Demands for their products at the moment were reasonably satisfactory, and sales and order book at a slightly higher level than the same time last year. On the other hand, a further wage increase was awarded last April, and the costs of certain raw materials used by the firm continued to rise.

Imports and Exports in September.—British exports in September reached £210,500,000, about 1 per cent below the average for the first half of this year. Compared with the monthly average for the third quarter of 1953 last month's total was about 4½ per cent higher. It was also nearly £5,000,000 more than the August figure. Imports, which showed an unusually sharp fall in August, rose £19,000,000 to £285,800,000 in September. Thus the adverse trade balance was £69,200,000 in September, compared with £52,800,000 in August.

Forthcoming Meetings

Until end of year.—"Popular Carriage" Exhibition (Two centuries of carriage design for road and rail) in the Shareholders' Meeting Room, Euston Station, London, N.W.1. Weekdays 10 a.m. to 7 p.m.; Sundays 2 to 7 p.m.

October 15 (*Fri.*).—Institute of Transport, Tees-side Section, at the Cleveland Scientific & Technical Institution, Middlesbrough, at 7 p.m. Inaugural address by Mr. J. H. Baker, Chairman of the Section.

October 15 (*Fri.*).—Institute of Transport, York Graduate & Student Society, at the Railway Headquarters, York, at 7 p.m. Discussion on Institute examinations with the examinations officer.

October 16 (*Sat.*).—British Railways, Southern Region, Lecture & Debating Society. Full day visit to Dover Harbour.

October 18 (*Mon.*).—Institution of Electrical Engineers, at Savoy Place, London, W.C.2, at 5.30 p.m. Discussion on "Electricity in the future," opened by the President.

October 18 (*Mon.*).—Historical Model Railway Society, at the headquarters of the Stephenson Locomotive Society, 32, Russell Road, London, W.14, at 7 p.m. Paper on "Railway safety legislation and the lessons of some serious accidents," by Mr. T. S. Lascelles.

October 19 (*Tue.*)—Institute of Transport, Metropolitan Graduate & Student Society, at 80, Portland Place, London, W.1, at 5.45 for 6.15 p.m. Discussion on "Competition and the transport industry," opened by Mr. F. H. Conway.

October 19 (*Tue.*).—Institute of Transport, Newcastle Graduate & Student Society, at the Railway Literary Institute, at 7 p.m. Discussion on Institute examination with the examinations officer.

October 20 (*Wed.*).—Permanent Way Institution, London Section, at the headquarters of the British Transport Commission, 222, Marylebone Road, London, N.W.1, at 6.30 p.m. Paper, illustrated by lantern slides, entitled "Automatic train control in Great Britain," by Mr. J. H. Currey.

October 20 (*Wed.*).—Institution of Loco-

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motive Engineers, at the Institution of Mechanical Engineers, 1, Birdcage Walk, London, S.W.1, at 5.30 p.m. Paper on "The design of light alloy coaches for East African Railways," by Mr. J. F. Thring.

October 21 (*Thur.*).—British Railways, Western Region, Lecture & Debating Society, in the Headquarters Staff Dining Club, Bishop's Bridge Road, Paddington, W.2, at 5.45 p.m. Young men's discussion.

October 21 (*Thur.*).—British Railways, North Eastern Region, York Locomotive Society, at the Railway Institute, Queen Street, York, at 6.45 p.m. Paper on "Locomotives and their work on the Southern Region," by Mr. S. C. Townroe, Assistant to the Motive Power Superintendent, Waterloo.

October 21 (*Thur.*).—Institute of Transport, East Midlands Section, at the Mechanics Institution, Nottingham, at 1 p.m. Paper on "The work of the railway inspectorate of the Ministry of Transport & Civil Aviation," by Brigadier C. A. Langley.

October 26 (*Tue.*).—British Railways, Southern Region, Lecture & Debating Society, at the Chapter House, St. Thomas' Street, London, S.E.1, at 5.45 p.m. Paper on "The mining industry," illustrated by lantern slides, by Mr. Lambton Wilkinson, Lectures Officer, National Coal Board.

October 26 (*Tue.*).—Institute of Transport, at 80, Portland Place, London, W.1, at 6 p.m. Visual aids meeting.

October 28 (*Thur.*).—Institution of Railway Signal Engineers, at the Institution of Electrical Engineers, Victoria Embankment, W.C.2, at 6 p.m. Paper on "Signal engineering in Germany today," by Mr. G. Reschub.

October 29 (*Fri.*).—Institution of Railway Signal Engineers, at the Criterion Restaurant, Piccadilly, London, W.1, at 6.15 for 6.45 p.m. Annual dinner and dance.

Railway Stock Market

Stock markets remained strong and active under the lead of industrial shares which had a further stimulus from financial results showing higher profits and dividends. Sentiment has not been affected by talk of the possibility of a general election, because the prevailing view in the City seems to be that in any case an election is likely to be left until after the Budget. It is being widely assumed that the Budget will bring some reduction in taxation, though it is recognised that any large tax cuts cannot be expected. British Funds have been rather less firm, partly because there is now little talk of a reduction in the bank rate to 2½ per cent. Result of the John Summers offer was regarded as good, and in initial dealings there was a premium of up to 6d. It is apparent that the public are now more favourably disposed to steel shares. The view seems to have gained ground that yields of over 7 per cent on steel shares more than discount the political risk of a future change of Government, and there is a growing assumption that even in that event, steel might not be re-nationalised.

There was again only selective activity in overseas and foreign railway stocks. New issue talk put Canadian Pacifics easier at $48½ earlier in the week; the 4 per cent preference and debenture stocks were steady at £68⅞ and £91½ respectively. White Pass became more active, but at $32 failed to hold best levels; the convertible debentures were £110 and the loan stock £33.

Business at 23½ was recorded in Midland of Western Australia, and at 45 in the 4 per cent second debentures, while the 4½ per cent first debentures were 92½. Emu Bay Railway 5 per cent and 4½ per cent debentures were 44½ and 62½ respectively. Algoma Central 5 per cent first debentures have transferred at $245, while business at £97½ was recorded in Atlantic & North West Railway 4 per cent debentures.

Among Indian rails, Barsi ordinary stock kept at 92½, and West of India Portuguese 5 per cent debentures have been dealt in at 86.

Dorada ordinary stock became more active in foreign rails, changing hands at 81, and the 6 per cent debentures at 90. Guayaquil & Quito 5 per cent first bonds transferred up to 59¼, while business in Chilian Northern 5 per cent debentures ranged from 28½ to 29¼.

Antofagasta stocks showed rather more activity with the preference firmer at 44½, the 5 per cent (Bolivia) debentures 71 and the ordinary stock 8¼. The ordinary has been out of the dividend list ever since 1931, and in view of the arrears of interest on the preference, it must be a long while before resumption of ordinary dividends can be possible. Nevertheless, from the long term angle there might be prospects of good appreciation in price if a takeover were ever proposed, because in that event an offer for the ordinary stock would have to be based on assets values, which is of course well over the current market price. This year, the ordinary stock has moved between 7⅞ and 9¾ and the preference stock between 39 and 45¼.

Costa Rica ordinary stock was 11 and the 6½ per cent first debentures 67½. Brazil Railway bonds eased from 8 to 7½, and San Paulo units were 3s. 6d. Taltal Railway shares kept at 13s. 6d. and Nitrate Rails shares were 19s. 9d. Paraguay Central 6 per cent debentures showed business at 21, and Mexican Central "A" debentures were 74. United of Havana second income and consolidated stocks have been more active around 35½ and 5⅜ respectively.

Firmness was again maintained in road transport shares with Southdown and West Riding both at 35s. 6d. and Lancashire Transport 61s. 6d.xd. B.E.T. "A" 5s. units moved up to 65s. 3d.

The success of the John Summers issue and the premium of up to 6d. on the shares in initial dealings, helped other steel shares. Stewarts and Lloyds gained 7½d. at 38s. 6d. and United Steel 3d. at 25s. 9d. Elsewhere, Guest Keen were good on higher dividend hopes and moved up further to 67s. On the other hand, Babcock & Wilcox eased to 68s. after the interim dividend. Vickers changed hands around 40s. Thornycroft were favoured on yield considerations and further improved to 48s. George Cohen shares strengthened to 12s. 6d. because of the attractive terms of the new loan stock issue which is confined to shareholders. T. W. Ward were steady at 57s. 3d.

Small mixed movements ruled among shares of locomotive builders and engineers. Beyer Peacock came back further to 41s. 6d., Hurst Nelson were 39s. 9d., North British Locomotive 15s. 1½d. and Birmingham Carriage 27s. 10½d. Vulcan Foundry eased to 29s. 3d., Gloucester Wagon 10s. shares were 18s. 1½d. xd., Charles Roberts 5s. shares 9s. and Wagon Repairs 5s. shares 13s. 10½d.

OFFICIAL NOTICES

The engagement of persons answering Situations Vacant advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

QUANTITY SURVEYOR/ESTIMATOR required. Permanent position with accommodation offered to suitably qualified man. Apply to The Eagre Construction Co., Ltd., Scunthorpe, Lincs.

DRAUGHTSMAN required, experienced, railway carriages/wagons, apply giving usual details to Cambrian Wagon & Engineering Co. Ltd., Maindy, Cardiff.

VACANCIES FOR DRAUGHTSMEN. Applications are invited for the following positions:—One fully qualified Mechanical Draughtsman with experience in locomotive traction. Experience in diesel electric traction would be an advantage. Two fully qualified Carriage and Wagon Draughtsmen with experience of up-to-date practice, including metal construction. Applications stating qualifications, age, experience and present employment, should be addressed to the Chief Mechanical Engineer, C.I.E., Inchicore Works, Dublin. Coras Iompair Eireann.

LOCOMOTIVE MAINTENANCE INSPECTOR required by the NIGERIAN GOVERNMENT RAILWAY for one tour of 12/24 months in the first instance. Salary scale (including expatriation pay) £1,434 rising to £1,560 a year. Gratuity at the rate of £150 a year. Outfit allowance £60. Free passages for officers and wives and assistance towards cost of children's passages or grant of up to £150 annually for their maintenance in U.K. Liberal leave on full salary. Candidates must have served a 5-year railway apprenticeship followed by at least 10 years running shed experience and must have reached Class II Shed Master or Class II Mechanical Foreman. Write to the Crown Agents, 4, Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M2C/30225/RA.

AUSTRALIA. QUEENSLAND GOVERNMENT RAILWAYS. VACANCIES — DESIGNING CIVIL ENGINEERS. Applications will be received by the undersigned until 15th November, 1954, from persons desiring to join the service of the Commissioner for Railways, Brisbane, Queensland, Australia, as Designing Civil Engineer, Chief Engineer's Branch (2 required). Present Salary Range is £1,049 10s. 0d. minimum to £1,184 10s. 0d. maximum per annum (Australian currency). Applicants must hold Degree in Civil Engineering from a recognised University or equivalent qualification such as Corporate Membership of the Institution of Civil Engineers. They must be capable of making complete stress calculations, design and working drawings for any Civil Engineering structures, including railway and road bridges of all types, retaining walls, dams, drainage works, and water supply schemes, and must have had not less than two (2) years' experience since graduation in designs of this type, including bridge designs. Applicants should state age, qualifications and experience and attach copies of references as to character and ability. Appointees will be entitled to the usual pass and privilege ticket concessions applicable to employees of the Queensland Railways. D. J. MUIR, Agent-General for Queensland, Australia, 409-410 The Strand, London.

THE High Commissioner for India invites tenders for the supply of:—540 Pieces Laminated Springs, made from Silico-Manganese Spring Steel. Water hardening quality. Forms of tender may be obtained from the Director-General, India Store Department, 32/44 Edgware Road, London, W.2, on or after 15th October, 1954, at a fee of 10s. which is not returnable. If payment is made by cheque, it should please be made payable to "High Commissioner for India." Tenders are to be delivered by 2 p.m. on Friday, 12th November, 1954. Please quote reference No. 205/54/DH/RLY.3.

THE High Commissioner for India invites tenders for the supply of:—2 Firebox Throat Plate (inside) steel for "XE" Class Locomotives. 10 Steel Fireboxes (inside) for "AWC" Class Locomotives. 4 Steel Fireboxes (inside) for "GS" Class Locomotives. 2 Firebox back plate (inside) for "AWE" Class Locomotives. Forms of tender may be obtained from the Director-General, India Store Department, 32/44 Edgware Road, London, W.2, on or after 15th October, 1954, at a fee of 10s., which is not returnable. If payment is made by cheque, it should please be made payable to "High Commissioner for India." Tenders are to be delivered by 2 p.m. on Friday, 12th November, 1954. Please quote reference No. 175/54/DH/RLY.3.

TRANSPORT ADMINISTRATION IN TROPICAL DEPENDENCIES. By George V. O. Bulkeley, C.B.E., M.I.Mech.E. With chapters on Finance, Accounting and Statistical Methods. In collaboration with Ernest I. Smith, F.C.I.S., formerly Chief Accountant, Nigerian Government Railway. 190 pages Medium 8vo. Full cloth. Price 20*s.* By post 20*s.* 6*d.* *The Railway Gazette*, 33 Tothill Street, London, S.W.1.

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